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**The 1948 Meetings will be held in San Francisco
during the week beginning August 8**

**THE OFFICIAL PUBLICATION OF THE AMERICAN
ASSOCIATION OF COLLEGES OF PHARMACY**

"Vivisection is permissible from the standpoint of morality and from the standpoint of usefulness. Anti-vivisectionists are merely imitators of the nineteenth century philosopher, Scopenhauer, who, while loving his dog, hated mankind."—Sister Mary Kateri, R.S.M.

Volume XII

January, 1948

Number 1

**INSTITUTIONS HOLDING MEMBERSHIP IN THE AMERICAN ASSOCIATION
OF COLLEGES OF PHARMACY**

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THE AMERICAN JOURNAL

OF

PHARMACEUTICAL EDUCATION

Volume XII

January, 1948

Number 1

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The Abilities and Interests of Pharmacy Freshmen

H. H. Remmers, Director

and

N. L. Gage, Test Technician

Student Personnel Studies

The Pharmaceutical Survey

American Council on Education*

* To carry out these studies, the authors have been on leave from The Division of Educational Reference, Purdue University.

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The Abilities and Interests of Pharmacy Freshmen

H. H. REMMERS, Director
and
N. L. GAGE, Test Technician
Student Personnel Studies
The Pharmaceutical Survey
American Council on Education

PART I

The Predictive Testing Program

I. Introduction

How do the intellectual abilities of freshmen in American schools of pharmacy compare with those of freshmen in other curricula in American colleges and universities? It has often been said that such a comparison, if made, would redound to the disadvantage of pharmacy freshmen. This view, widely held we believe, has until now not been put to any scientific test. The present report presents evidence of a comprehensive, objective, quantitative, and scientifically relevant sort bearing on the issue.

It is pertinent at this point to relate the Predictive Testing Program of The Pharmaceutical Survey to American higher education in general, and to the profession of pharmacy and The Pharmaceutical Survey in particular. Higher education in America has for a generation been developing a scientifically based personnel technology looking toward the solution of its problems in the selection and placement of students. Notwithstanding the importance of the pharmacist—of his selection, training and professional function—the inadequacy of previous utilization by the profession of available scientific knowledge concerning personnel problems has been generally recognized by those technically competent to pass judgment. Personnel techniques available well before World War II and, of course, greatly developed during the war, have been extensively applied in other educational, industrial and military areas. They have been applied however only sporadically and institution-

wise in pharmacy—at least if the paucity of published technical literature is any indication.

The Pharmaceutical Survey was launched early in 1946 under the auspices of the American Council on Education with Dr. Edward C. Elliott as Director. In the preliminary schedule of studies to be undertaken by The Survey was a group entitled "Students—Quality, Quantity, and Qualifications." Included in this group of studies were the following titles:

- UST (11) Criteria for the Selection and Admission of Pharmacy Students
- UST (12) Provisions for Guidance of Pharmacy Students
- UST (13) Development of Special Aptitude and Achievement Tests; Comparison of Student Achievement and Progress
- UST (14) Place and Future of Women in Pharmacy

The Predictive Testing Program here reported is a partial implementation of these studies. It was apparent that adequate execution of these studies would necessitate the cooperation of specialists in the field of educational measurement and guidance. The present authors under the general direction of the Director of The Survey were charged with responsibility for the Student Personnel Studies in The Survey. A technical advisory committee was also appointed consisting of Professor Harold Edgerton, Department of Psychology, The Ohio State University; Dr. T. R. McConnell, Dean of the College of Science, Literature and the Arts, University of Minnesota; Professor Ralph W. Tyler, Division of the Social Sciences, University of Chicago; Professor C. V. Netz, College of Pharmacy, University of Minnesota; Dean E. R. Serles, College of Pharmacy, University of Illinois, with the senior author of the present report as Chairman and Director of Student Personnel Studies, and the junior author as Test Technician.

II. The Predictive Tests

The prediction of relative success or failure in professional studies necessitates a "yardstick" of the success or failure to

be predicted. Ideally, development of predictive measures should proceed only in the light of definitive formulations of the criterion of achievement. Traditionally the criterion of success in professional training has been grades or semester marks assigned by faculties in the areas of instruction concerned. The possibilities of prediction in terms of such criteria have been thoroughly explored and reported in the literature of educational psychology. Such semester grades or marks, as is well known, are relatively unreliable. This unreliability in turn sets limits to the possibilities of prediction. Within these limits, however, prediction has been good; correlations between predictive measures and semester grades of .40 to .60 have been typical. But it has been realized for some time that the greatest room for improvement in these figures, upon which selection, guidance and placement ultimately depend, lies in the criterion measures to be predicted.

In pharmaceutical education, this means developing measures of success, be they comprehensive examinations, performance tests, or follow-up data, as free as possible from the limitations that beset instructors' grades. Theoretically, such measures should be in hand before the development of predictive measures. A compromise with this rationale was necessary and feasible in planning the Predictive Testing Program. First, the time limit set for The Pharmaceutical Survey made it impossible to wait for the development of more adequate criterion measures than are now available. At least four years would have been necessary to build and evaluate predictive measures in the light of previously developed measures of achievement and success. Secondly, in the light of a vast accumulation of findings in other types of academic prediction, such as those in liberal arts, engineering and medical curricula, it was possible to base the selection of predictive instruments upon fairly strong hypotheses concerning the nature of the abilities correlated with success in pharmacy training.

Furthermore, since it was intended that comparisons should be possible between freshmen entering schools of pharmacy and freshmen entering other curricula in institutions of higher

education, at least some of the tests should have norms based upon such non-pharmacy freshmen. That the tests should be thoroughly standardized as to administration and completely objective in scoring was necessary to insure the comparability of scores between the various colleges of pharmacy. To enable exploration of the possibility of improving prediction through measures of non-intellective aspects of students, such as interests, preferences and temperament, it was desirable that at least a sample of the pharmacy freshmen be given a test of such traits. In the light of these considerations, the following battery of tests was selected by the Technical Advisory Committee for use in the fall 1946 Predictive Testing Program:

1. *American Council on Education Psychological Examination for College Freshmen, 1946 Edition.* This is a general scholastic ability test whose previous editions have been found to predict freshman college grades about as well as is possible with any single available test. It measures speed and accuracy in the solution of problems involving words, numbers, and diagrams. In addition to a total score, it yields two relatively uncorrelated sub-scores, "Q" or "quantitative" and "L" or "linguistic." It was anticipated that norms for this test would be available on the basis of tens of thousands of college freshmen entering hundreds of other institutions of higher education in the fall of 1946. By means of these norms, it would be possible to compare pharmacy freshmen with students entering non-pharmacy curricula in colleges throughout the nation.
2. *Cooperative English Test, Form PM.* This test measures, in a form probably somewhat more affected by previous school experience, the student's achievement in English usage (grammar and diction, punctuation, capitalization, sentence structure, spelling and vocabulary). Nation-wide norms are available for this test so that pharmacy freshmen can be compared with other groups of students.
3. *Purdue Mathematics Training Test, Form XM.* This is a test to determine mastery of the fundamentals of arithmetic and algebra. It has been found in a small sample of students ($N=62$) to be the single test most highly predictive of freshmen grades in the School of Pharmacy at Purdue University. Its relatively high emphasis on arithmetic was considered to make it uniquely suitable for the prediction of success in pharmacy training. Norms for this test are available on only a local rather than a national basis.

4. *Purdue Physical Science Test, Form AM.* This test has been found to predict substantially the achievement of high school students and college freshmen in courses in physics and chemistry. It deals with basic mathematics (operations and problem analysis) and scientific judgment (vocabulary, facts, experience and interpretation). Norms for this test are not available on an extensive nation-wide basis.
5. *Pharmacy Background and Personal Data Blank.* The first, or personal data, section consists of a set of questions dealing with home background, work experience, community and high school extracurricular activities, and socio-economic status. The second section consists of questions requiring the application of knowledge that may have been acquired from experience as an apprentice in a drug store or elsewhere. It is intended to provide a measure of information and, indirectly, interest in pharmacy. This section was adapted from the Pharmacy Aptitude Test of the University of Illinois College of Pharmacy. It is intended that each of the questions in the first section be correlated individually with the criterion and that the total score and individual questions for the second section be similarly correlated. No norms are available for this test.
6. *The Kuder Preference Record, Form BM.* This test obtains a systematic and quantitative record of preferences for nine distinct types of activities: mechanical, persuasive, computational, artistic, literary, musical, scientific, social service and clerical. This test was given to only about 1,000 of the pharmacy freshmen entering a randomly selected group of colleges of pharmacy. Norms for this test are available for 3,863 high school students, various groups of college students, 2,667 adult men and 1,429 adult women in general, and adults engaged in various occupations. The norms for high school students in general have been developed, rather than by specific grades, because research has shown little difference between one class and another. It is hoped that the non-intellective measures obtained with this test, in combination with the scores for the other tests, will improve the predictive value of the battery. It may also prove to be possible through the use of these interest scores to develop procedures for the guidance of pharmacy students among the various types of pharmaceutical occupations, such as research, retail services, pharmaceutical supplies salesmanship, etc.

During July and August 1946, detailed plans for the execution of the program were made. A detailed manual of directions to examiners was prepared for the guidance of the staff members who were to administer the tests in each of the participating colleges of pharmacy.

III. The Students

Upon completion of the planning by the Technical Advisory Committee in July 1946, the Director of The Survey sought the participation of colleges of pharmacy by means of the following letter:

To the Deans of Accredited Colleges of Pharmacy:

The Pharmaceutical Survey, announced through the press release sent to you on May 9, is now under way. On June 26 the general Committee for The Survey held its first meeting in Washington. A brief statement concerning the meeting, including the names of the members of the Committee, already has been sent to you.

During the discussions of the scope and procedure of The Survey, the Committee fully recognized that the constructive success of The Survey was dependent upon the continuous and cooperative participation of the colleges. This has been emphasized by Dean B. V. Christensen, Chairman of the Executive Committee of the American Association of Colleges of Pharmacy, in his communication of July 1, 1946, to the Deans of the Colleges of Pharmacy. The responses to my own letter of May 15 had already revealed the readiness of the institutions to assume their full share of the undertaking.

As things now appear, I am assuming that all of the accredited colleges are prepared to honor The Survey requisitions for assistance.

Preliminary discussions with the representatives of the Executive Committee of the American Association of Colleges of Pharmacy indicated that, of the planned Survey studies, those relating to the quality, quantity, and qualifications of students were of first importance. It is therefore now proposed that The Survey undertake, at the beginning of the academic year 1946-1947, the measurement of the quality of entering freshmen in a representative group of the Colleges of Pharmacy. The detailed plans of the project are now being prepared by a group of recognized leaders in the fields of testing and measurement.

Your institution is invited to participate in this measurement project which promises to be a forward step for the professional preparation of pharmacists. It may be anticipated that the results will be of substantial benefit to your institution and your students.

These first tests will be provided without cost; they will be centrally scored and the results for the institution, together with

relevant information, will be sent to you soon after the tests are completed. The colleges will be asked merely to administer the tests. This requires staff personnel, testing time (approximately eight hours) and suitable rooms. The number of staff personnel is estimated at one person per thirty students, or fraction thereof. Specific and detailed instructions will accompany the material for the test. Although desirable, it is not necessary that the examiner have some training and experience in psychological testing.

In order that this first testing program may be adequately planned, it is requested that you fill out and return to us at your earliest possible convenience the enclosed blank. This should be in my hands not later than August 1, 1946.

The following 54 colleges of pharmacy agreed to participate in the fall 1946 testing program:

Alabama	Loyola University
Alabama Polytechnic Institute	Xavier University
Howard College	
California	University of Maryland
University of California	
University of Southern California	Massachusetts College
University of Colorado	
Colorado	Ferris Institute
University of Colorado	Detroit Institute
Connecticut	Wayne University
University of Connecticut	
District of Columbia	University of Minnesota
George Washington University	
Howard University	University of Mississippi
University of Florida	
Florida	St. Louis College
University of Georgia	University of Kansas City
Georgia	Montana State University
University of Illinois	
Illinois	Creighton University
Purdue University	
Butler University	Rutgers University
Indiana	Fordham University
University of Kansas	Union University
Kansas	Columbia University
Louisville College	
Kentucky	

Long Island University	South Carolina
University of Buffalo	Medical College of the State of South Carolina
North Carolina	University of South Carolina
University of North Carolina	
North Dakota	South Dakota
North Dakota Agricultural College	South Dakota State College
Ohio	Virginia
Western Reserve University	Medical College of Virginia
Ohio State University	
Cincinnati College	
Oklahoma	Washington
University of Oklahoma	University of Washington
Oregon	State College of Washington
Oregon State College	
Pennsylvania	West Virginia
Philadelphia College	University of West Virginia
University of Pittsburgh	
Duquesne University	
Wisconsin	New Mexico
	University of Wisconsin
Puerto Rico	University of New Mexico
	University of Puerto Rico

Complete sets of test results were obtained from forty-three institutions. Eleven of the institutions listed above are not completely represented in the data reported here for such reasons as misunderstanding of instructions, use of different forms or editions of tests, late administrations of the tests, late return of data, and others. For these reasons at least some data from the following eleven institutions could not be included in the present report.

Institution	City	State
Columbia University.....	New York.....	New York
University of Georgia.....	Athens.....	Georgia
University of Oklahoma.....	Norman.....	Oklahoma
Albany College of Pharmacy.....	Albany.....	New York
University of California.....	San Francisco.....	California
University of Minnesota.....	Minneapolis.....	Minnesota
University of Kansas City.....	Kansas City.....	Missouri
University of Buffalo.....	Buffalo.....	New York
University of North Carolina.....	Chapel Hill.....	North Carolina
Duquesne University.....	Pittsburgh.....	Pennsylvania
Creighton University.....	Omaha.....	Nebraska

The geographical distribution of the institutions reported on here is shown on the accompanying outline map of the United States, Chart 1, except for the University of Puerto Rico. It is clear from this map that the institutions represent all regions of the United States and all eight of the districts of the American Association of Colleges of Pharmacy and of the National Association of Boards of Pharmacy.

Of the 3,326 freshmen whose test results on the A. C. E. Psychological Examination were used, 13 per cent are women. The proportion of pharmacy freshmen reported on here to the total number of freshmen entering colleges of pharmacy in the fall of 1946 is so large that for practical purposes they approximate the total population. In other words, the inclusion of the remaining schools of pharmacy would not change appreciably the results to be presented here.

IV. The Data

From most of the institutions participating in the program, the answer sheets filled out by freshmen were sent to the central office of the Student Personnel Studies in the Division of Educational Reference at Purdue University. These answer sheets were inspected for misplaced or inadequate marks made by students with the special pencils. The answer sheets were then scored electrically by means of the International Test Scoring Machine. Part scores as well as total scores were obtained for each answer sheet. Rosters of the names and total scores of its students were then sent to each institution.

Frequency distributions were made by men and women separately, and by both sexes together, for each institution. Such distributions were made not only for the total scores but also for the part scores on each test.

The tables and charts given below are based upon these frequency distributions taken individually and in various combinations. For each frequency distribution the following descriptive statistical measures have been obtained:

1. The arithmetic mean
2. The median, or 50th percentile
3. The upper and lower quartiles, or 75th and 25th percentiles, respectively
4. The standard deviation, a measure of the spread or variability of the scores in the distribution
5. The highest and lowest scores in the distribution

In the following discussion, the results for each test will be discussed separately along with references to the appropriate tables and charts. Interpretations and conclusions can be checked by the reader through inspection of the relevant table or chart.

A. The American Council on Education Psychological Examination for College Freshmen, 1946 Edition

1. *Comparisons of pharmacy and non-pharmacy freshmen.*—In Chart 2 are shown frequency polygons representing graphically the distributions of total, or gross, scores on the A. C. E. Psychological Examination for College Freshmen obtained by all the pharmacy freshmen and by a large sample of nationally selected college freshmen in the fall of 1946. The major conclusion to be drawn from a comparison of these frequency distributions is that *pharmacy freshmen do not differ in any educationally significant way from non-pharmacy freshmen in the abilities measured by this test.* The difference in averages, or central tendencies, of the scores is in favor of the pharmacy freshmen. This difference is statistically significant far beyond the 1 per cent level (critical ratio equals 7.3) so that the difference could hardly have arisen through chance fluctuations in random sampling. Inspection of these frequency polygons confirms the descriptive measures obtained. The distributions are far more notable for their overlap than for any difference between them; but that for pharmacy freshmen is somewhat less peaked, more spread out, and higher on the test-score scale.

The meaning of these results for pharmaceutical education is twofold. First, American colleges of pharmacy are receiving

students, at least in the fall of 1946, who are at least equal in scholastic ability to those received by American higher educational institutions in general. Secondly, the variability of these students in terms of their intellectual quality is at least as great as those received in four-year colleges of liberal arts and science. It may therefore be inferred that little selection of pharmacy students on an intellectual basis has been operating, either positively or negatively¹, other than that affecting college students in general.

2. *Comparisons among institutions.*—In Chart 3 are shown graphically the distributions of gross scores by institutions. The first 43 vertical bars and lines represent the distributions of gross scores in 43 colleges of pharmacy, arranged in descending order of median gross scores; the forty-fourth bar at the right of the chart represents the distribution of the scores of all 3,326 freshmen in pharmacy. The last bar to the right is for the distribution of scores for the 18,763 freshmen on whom the preliminary national norms are based.

The heavy part of each bar shows the range of scores of the middle half of the freshman class in each college; the thin line of each bar extends to the highest and lowest scores in each college, these extreme scores being indicated by stars. The short, solid, cross bars indicate mean scores, and the open cross bars indicate median scores.

The test-score scale is shown at the extreme left and right of the chart. The mean score of all pharmacy freshmen (105.15) is shown by the heavy horizontal line crossing the middle of the chart, while the light double line just above the mean line represents their median score (106.20).

The upper row of numbers (Colleges Nos. 1 to 43) across the bottom of the chart identifies the 43 college freshman classes; the second row indicates the standard deviation of each group

¹ The national norms for the American College Council on Education Psychological Examination for College Freshmen, 1946 Edition, are based on a preliminary report dated November 13, 1946, by Thelma Gwinn Thurstone and L. L. Thurstone.

and the third row gives the number of freshmen in each college group.

In College No. 1 the highest score is 172; the seventy-fifth percentile is 142.20; the median is 131.45; the mean is 127.10; the twenty-fifth percentile is 113.25; and the lowest score is 72. More than 75 per cent of the freshmen in College No. 1 are above the national pharmacy median.

The numbers assigned to the colleges in Chart 3 are the same in all subsequent charts.

Chart 3 shows great variations among institutions both in the average scholastic ability of the freshmen they enroll and in the variability or spread among these freshmen. The lowest scoring student in College No. 1, for example, received a score that would put him about at the average of the students in College No. 43. And yet in the second highest ranking institution, College No. 2, occurred one of the four lowest scores (22) found among these 3,326 pharmacy freshmen. One of the two highest scores (182) was obtained by a freshman in one of the middle ranking colleges (College No. 19).

3. *Comparisons of men and women.*—Of the 3,326 pharmacy freshmen whose scores on the A. C. E. Psychological Examination are reported, 2,897 were men and 429 were women. As is apparent from Chart 4, the men had a somewhat higher average score than the women. These differences between average scores of men and women are statistically significant at the 1 per cent level. Furthermore, the men were somewhat less variable in their scholastic abilities as measured by this test, and this difference in variability between the sexes is also highly significant statistically.

Inasmuch as the national norms for men and women show a similar difference in the same direction, these sex differences

may have been caused by the inclusion of test material favorable to men in our culture rather than to women. For example, the strong weighting of this test with numerical and spatial problems may have operated to the disadvantage of the women freshmen, who usually do better with verbal materials and worse with the "quantitative" tests. That this explanation does not hold for pharmacy freshmen will be shown below when the two types of test material are considered separately. An alternative interpretation of these sex differences in the national norms is that the sample of women included in these norms is actually lower in scholastic ability.

When the pharmacy male freshmen are compared only with the national norms for men their superiority in average performance is not nearly so great, the respective means for the male pharmacy freshmen and the male national norm sample being 105.85 and 104.45, respectively. For the women taken alone, the pharmacy and national mean scores are 100.30 and 100.60, respectively, the pharmacy women actually being very slightly inferior to the national norm sample of freshman women. It therefore seems likely that the superiority of the pharmacy freshmen to the national sample of non-pharmacy freshmen may have been occasioned by the much higher proportion of men in the sample of pharmacy freshmen. Regardless of any modification of our findings on the basis of these sex breakdowns, however, the fact remains that pharmacy freshmen are equal on this test to non-pharmacy freshmen. These results should serve to refute the traditional belief that schools of pharmacy are working with intellectually inferior raw material as compared with other institutions of higher education.

4. *Comparisons on the basis of "Q" and "L" scores.*—Since the A. C. E. Psychological Examination can be scored for two relatively independent types of scholastic ability, "quantitative" and "linguistic," it is of interest to compare the patterns of these abilities in pharmacy freshmen against those of freshmen entering American colleges in general.

TABLE 1

"Quantitative," "Linguistic" and Total Scores of Pharmacy and National Norm Freshmen on the A. C. E. Psychological Examination

		PHARMACY			NATIONAL		
		Men	Women	Total	Men	Women	Total
"Q"	Mean	40.46	38.62	40.22	41.38	37.45	39.70
	S.D.	11.68	11.80	11.72	11.20	10.60	11.20
"L"	Mean	65.50	61.55	65.00	63.60	63.35	63.48
	S.D.	16.50	17.25	16.85	15.70	16.10	15.85
Total	N	2853	419	3272	10,659	7898	18,555
	Mean	105.85	100.30	105.15	104.45	100.60	102.77
	S.D.	24.70	27.80	25.15	23.90	23.90	24.02
	N	2897	429	3326	10,661	8102	18,763

As is shown in Table 1, in the national norm sample of freshmen, the men achieved a significantly higher mean score (41.38) than the women (37.45) on the "quantitative" subtests. For pharmacy freshmen, on the other hand, the sex difference in these abilities, although in the same direction, is less than one-half as great; the mean for the men is 40.46 while that for women is 38.62.

On the linguistic factor, the national samples of men and women had mean scores of 63.60 and 63.35, respectively; these averages are practically equal. For the pharmacy freshmen, on the other hand, the means for men and women were 65.50

and 61.55 respectively. Here the men had a substantially higher average score than the women.

This means that more of the superiority of the pharmacy men over the pharmacy women resulted from the differences in their performance on the linguistic sub-tests rather than from differences on the quantitative sub-tests. Apparently the freshmen entering schools of pharmacy are distinguished from other freshmen in the greater difference between the sexes in those abilities involving verbal or linguistic material.

For both men and women combined, in both the pharmacy and the national non-pharmacy samples, the difference in both quantitative and linguistic average performances is in favor of the pharmacy freshmen. Thus all the pharmacy freshmen have a mean score of 65.00 for the linguistic sub-test as against 63.48 for the national group and, similarly, the pharmacy freshmen have a mean score of 40.22 on the quantitative test as against 39.70 for the national norm group. Clearly, the slight overall superiority of the pharmacy freshmen's average scores manifests itself about equally in both types of ability.

B. *The Cooperative English Test, Form PM*

1. *Comparison of institutional ranks.*—The results of the administration of this test are shown in Charts 5 and 6. It will be noted from Chart 6 that results for this test were available for three institutions in addition to those providing scores on the Psychological Examination. These institutions are numbered 44, 45 and 46 in Chart 7. In comparing ranks on the two examinations, the Psychological Examination and the English Test, the reader should beware of considering Nos. 44, 45 and 46 as ranks on the Psychological Examination although this interpretation is correct for the institutions assigned the numbers from 1 to 43.

In general there was a strong tendency for institutions to have the same ranks in their median scores on the Psychological Examination and on the English Test. This relationship between the ranks in median scores on the two tests, while

difficult to measure statistically because of the unequal numbers of cases in the various institutions, may nevertheless be expressed in terms of a rank-difference coefficient of correlation of .84 (rho).

2. *Comparisons of pharmacy and non-pharmacy freshmen.*—From Chart 5 it is evident that the distribution of scores for pharmacy freshmen in the fall of 1946 has a large amount of overlap with a distribution of similar scores based on college freshmen tested in the interval from 1932 to 1937. Despite this large overlap, however, it is apparent that the non-pharmacy national norm group of 1932-1937 is centered at a higher point on the scale than the pharmacy freshmen of 1946. The arithmetic mean for the national norm group is 55.6 while for the pharmacy freshmen it is 52.52. In variability the two distributions appear to be about the same; the standard deviations are 9.3 for the national norms and 9.6 for the pharmacy freshmen. The difference between these means cannot be tested for statistical significance because the number of cases upon which the national norms are based is not published. It is highly probable, however, that it would prove to be statistically significant.

The meaning of this slight inferiority of the pharmacy freshmen as compared with a national sample of freshmen entering liberal arts colleges between 1932 and 1937 is difficult to establish in the absence of controls of several relevant factors. Among these factors are (1) the proportion of women in these samples for the national norms, and (2) the effect of the distance in time from formal training in English which probably characterizes the pharmacy freshmen in so far as the sample is composed of veterans. That the pharmacy freshmen are somewhat superior in those linguistic abilities relatively uninfluenced by formal training, is indicated by their superior performance on the linguistic section of the Psychological Examination. Large parts of the Cooperative English Test deal with abilities, information and knowledge that may be considered to depend greatly on formal school training, and especially the recency of such training. At least, this seems

probable on the basis of subjective examination of the test content. To the extent that this is true, those pharmacy freshmen who are veterans were at a disadvantage on this test as compared with the freshmen whose scores entered into the national norms.

It should be noted that the norms above mentioned for the Cooperative English Test are those for colleges designated by the Cooperative Test Service as "Type II." These colleges are² "objectively defined as those in which the ~~entering~~ freshmen attain an average score on the A. C. E. Psychological Examination (Form 1937) which corresponds to a Scaled Score of 57 and to a percentile of 50 for reporting colleges. The average college in the list of colleges approved by the Association of American Universities is fairly representative of this classification. This type may be thought of as most appropriate for the typical 'liberal arts college.'" If we use the norms for colleges of "Type I," which are most generally undergraduate colleges of universities and which are probably best designated as pre-professional colleges, the mean score of the national norm group of entering freshmen is 60.3, which is still higher than the mean of pharmacy freshmen in the fall of 1946. The mean score of students in colleges of "Type III," typically junior colleges and teachers colleges, is 48.1, somewhat lower than the mean of 52.5 for the pharmacy freshmen. It is clear that the colleges of pharmacy have attracted students in the fall of 1946 who on this Cooperative English Test fall somewhere between the averages of the colleges of Types II and III as defined by the Cooperative Test Service.

3. *Part scores on the English Test.*—The Cooperative English Test, PM, has three parts: Part 1: English usage (Section 1: grammar and diction; Section 2: punctuation; Section 3: capitalization; and Section 4: sentence structure); Part 2: spelling; and Part 3: vocabulary. If the hypothesis set forth above to explain the low average performance of the pharmacy freshmen as compared with the national norm group (on the basis of the probability that

²The Cooperative Test Service, *A Booklet of Norms: Introduction* (New York: Educational Testing Service, 1938) p. 4.

many pharmacy freshmen had been away from formal schooling for some years) is valid, then we should find the pharmacy freshmen suffer by comparison with national norms in English usage and spelling but not in vocabulary. That is, English usage and spelling may be considered types of knowledge rather strongly affected by the recency of formal schooling, whereas vocabulary may be considered a type of ability so largely influenced by out-of-school activities, environment, and interests as to be relatively free from the effects of recency of schooling.

These expectations are borne out by the comparisons of mean scores on the three parts of the English Test. Table 2 gives the relevant figures. The mean of the pharmacy freshmen on Part 1, usage, is 49.2 while the mean of the national norm for Type II colleges is 55.7; the pharmacy freshmen are substantially lower in average performance. Similarly, on Part 2, spelling, the mean score of the pharmacy freshmen is 51.18 while the mean for the national norms of Type II colleges is 53.6. Again the pharmacy freshmen suffer by the comparison. But in Part 3, vocabulary, the two means are approximately the same, 57.0 for the pharmacy freshmen and 57.1 for the national norms. If our assumptions are valid, that recency of training differently affects scores on the three parts of the test, and that a large percentage of the pharmacy freshman men have been out of school for several years in military service, then our interpretations of these results must be far more favorable to pharmacy freshmen as compared with non-pharmacy freshmen.

It should also be noted that when the pharmacy freshman women alone are taken into account, their means are much closer to those of the national norm group, and in fact their mean is slightly higher on Part 2. The men, when considered separately, turn out to have a slightly higher mean score on Part 3 than does the national norm group and are higher than the pharmacy freshman women in their mean performance on the vocabulary test, Part 3.

TABLE 2

Part and Total Scores on the Cooperative English Test, Form PM, of Pharmacy and National Norm Freshmen

	N	PHARMACY			NATIONAL (Type II)	
		Men	Women	Total	Total	
Part I: Usage	N	2768	406	3174	Not Published	
	Mean	48.57	53.46	49.20		55.7
	S.D.	8.74	10.86	9.18		9.1
Part II: Spelling	N	2768	406	3174	Not Published	
	Mean	50.76	53.91	51.18		53.6
	S.D.	11.28	10.58	11.24		9.3
Part III: Vocabulary	N	2768	406	3174	Not Published	
	Mean	57.30	55.11	57.03		57.1
	S.D.	10.74	11.54	10.87		9.5
Total	N	2807	410	3217	Not Published	
	Mean	52.25	54.38	52.52		55.6
	S.D.	9.42	10.67	9.63		9.3

The general conclusions concerning the abilities and achievements in English of pharmacy freshmen in the fall of 1946 must be that the pharmacy freshmen are inferior in those achievements highly dependent upon the recency of formal training but substantially equal to the national norm group of 1932 to 1937 in vocabulary, a type of ability that may be considered relatively free from the influence of recency of schooling.

C. The Purdue Mathematics Training Test, Form XM

The remaining three ability tests of the predictive battery are not equipped with sets of norms based on samples of college freshmen in general. These tests were included in the battery, not to enable comparisons of pharmacy freshmen with other groups, but rather to insure comprehensive measurement of abilities considered predictive of success in pharmacy.

In the absence of norms that could be used for comparing pharmacy freshmen with non-pharmacy freshmen, interpretations of results on this test must be restricted to those possible within the present group. Chart 7 shows that the frequency distributions of the total scores for pharmacy freshmen men and women are so similar in form as to indicate no significant difference in the mathematics achievement of the two sexes. This impression is borne out by the means, medians, and standard deviations of the two distributions, these being so nearly equal as to preclude any finding of sex differences on this test. In this respect the pharmacy freshmen differ from college freshmen in general, since the men are usually superior in mathematics achievement to the women in such groups.

Chart 8 shows the distributions of total scores on the Mathematics Training Test obtained by the students within the individual institutions. Wide variations in the averages and variabilities of the scores of the institutions is readily apparent.

The relationship between the rank of the medians of the institutions on the Psychological Examination and on the Mathematics Training Test is again fairly high as indicated by a rank-difference coefficient of correlation (ρ) of .69.

One interesting comparison that can be made is that between the scores obtained by pharmacy freshmen throughout the nation on the Mathematics Training Test and those obtained by approximately 2,000 freshmen at Purdue University in September 1946. Since Purdue University to a major extent attracts students interested in and qualified for engineering

training, it is to be expected that the average performance of all its entering freshmen on the Mathematics Test should be substantially higher than that of college freshmen in general and also of pharmacy freshmen. These expectations are fulfilled. Thus the mean of all Purdue University freshmen some years ago on the Iowa Mathematics Training Test, Form B, was 37.5 as against a mean of 31 for the norm group. Whereas the median score on the Purdue Mathematics Training Test of the pharmacy freshmen is 29.38, that of Purdue University freshmen who are largely preparing for engineering careers is 39.50. The upper quartiles of the pharmacy freshmen and Purdue freshmen, respectively, are 37.40 and 51.00; similarly, the lower quartiles are 23.94 and 31.00, for pharmacy and Purdue University freshmen, respectively.

D. *The Purdue Physical Science Test, Form AM*

Since this test also lacks national norms, it will be possible to interpret the results only in terms of intra-pharmacy differences. Charts 9 and 10 show the distributions of these scores for male and female pharmacy freshmen and for each of the institutions. The mean score of the men is significantly higher than that of the women, as is to be expected of college students in general on a test containing material that appeals so differently to men and women in American society. That is, since the test involves interest in, and understanding of, mechanical relationships and "intuitive physics," and since in our culture men are traditionally more exposed to and encouraged to learn such material than are women, the pharmacy freshman men are understandably superior to the women in the abilities measured by this test. At Purdue University, where the test has been used with entering freshmen for several years, similar sex differences are always found. The median score of Purdue University freshman men is 83.0 with an upper quartile of 95.0 and a lower quartile of 70.5; for Purdue University freshman women, on the other hand, these statistics are 64.0, 79.5, and 53.5, respectively. These differences are, of course, exaggerated at Purdue University since most of its entering freshman men are enrolling in the

Schools of Engineering while most of the entering women enroll in the School of Home Economics; their abilities and interests are therefore far more disparate than would be expected of men and women who are all interested in and "self-selected" for pharmacy.

The relationship between the median score ranks on the Physical Science Test and those on the Psychological Examination may be expressed by a rank-difference coefficient of correlation of .78. It is evident that on this test also the institutions tend to rank in about the same order as that in which their medians on the Psychological Examination placed them.

E. *The Pharmacy Background Test*

Charts 11 and 12 show the distributions of scores on this test obtained by men and women and by students in the various institutions. It is evident from Chart 11 that, since there was a tendency for the scores to "bunch up" at the upper end of the score scale, this test was somewhat too easy for optimal discrimination for the group of pharmacy freshmen to whom it was administered. The average performance of the men on this test was somewhat superior to that of the women, but the variability of both groups was about the same.

The relationship between (1) the ranks of the institutions on the basis of their median scores on this test and (2) the ranks of the institutions on the basis of their median scores on the Psychological Examination, results in a rank-difference coefficient of correlation (ρ) of .63. Again the institutions tend to have the same ranks on both tests.

F. *The Kuder Preference Record, Form BM*

This test was used not to measure the abilities of pharmacy freshmen but rather to obtain some appraisal of non-intellectual characteristics considered as likely to prove predictive

of satisfaction with and achievement in pharmacy. The likes and dislikes, or preferences, for nine different kinds of activity which are appraised by this test should serve to indicate not only the future success of pharmacists in those tasks dependent on various intellectual achievements and abilities, but probably even more, those aspects of personality and temperament that determine fitness for the practice of pharmacy in general and for various special activities in which pharmaceutically competent persons may engage.

This test was given only to 730 pharmacy freshmen in a randomly selected group of 12 institutions in order to enable future experimental investigation of the predictive value of the test. The scores were tabulated separately for men and women and are here compared with those of various groups for whom norms are provided in the manual of the test.³

Chart 13, based on the data in Table 3, shows the deviations of various groups from the average score obtained by the basic norm group consisting of 1,858 high school boys and 2,005 high school girls in high schools well distributed over the country. In each case the deviations of the averages of the various groups are shown with respect to the high school group of like sex. The horizontal line from which the bars of the chart deviate represents the average score, for each of the nine kinds of preference, of the high school boys and girls. It will be noted from the legend that those bars which are striped designate averages for women, while those which are solid or dotted designate averages for males. The vertical scale has been pointed off in percentiles.

1. *Comparisons of pharmacy freshman men.*—As compared with high school boys, the pharmacy freshman men obtained substantially lower average scores for Mechanical interests but were, on the other hand, much higher in Scientific and Social Service interests. The group of male drug-store managers and pharmacists whose averages are reported

³G. Frederic Kuder, *Revised Manual for the Kuder Preference Record* (Chicago: Science Research Associates, 1946).

TABLE 3
**Kuder Preference Record Scores of Pharmacy Freshman Men and Women,
 and of Various Other Groups***

PREFERENCE SCALES												
			1 Mechan- ical	2 Compu- tational	3 Scienc- ific	4 Persua- sive	5 Artis- tic	6 Liter- ary	7 Mus- ical	8 Social Service	9 Cler- ical	
Pharm. Freshmen	M	627	Mean	66.70	33.76	75.51	69.45	43.20	43.54	18.68	69.55	49.95
		S.D.	19.16	10.44	15.44	18.65	14.30	19.15	10.16	18.15	13.95	
Adults	F	109	Mean	49.06	31.14	72.78	37.15	48.40	46.30	23.36	76.70	53.40
		S.D.	17.92	10.50	13.80	14.80	14.15	19.40	8.60	18.30	15.85	
High School Pupils	M	2667	Mean	78.61	35.26	64.03	74.37	46.12	47.77	16.60	73.71	52.14
		S.D.	22.81	10.58	15.52	20.61	13.56	15.10	9.64	17.53	13.54	
Students Preparing for F Pharmacy	F	1429	Mean	52.67	31.75	54.70	61.50	53.43	52.60	21.47	81.42	62.31
		S.D.	17.07	11.55	14.72	16.96	16.41	15.69	9.18	18.82	16.81	
Drugstore Managers and Pharmacists	M	1858	Mean	77.74	35.22	68.22	66.94	48.02	47.38	18.42	61.86	53.98
		S.D.	20.20	10.37	15.81	14.82	14.82	14.08	10.11	15.47	12.76	
Students Preparing for F Pharmacy	F	2005	Mean	49.90	28.94	52.62	65.58	52.22	49.22	23.68	79.18	63.26
		S.D.	15.20	10.00	15.70	13.33	16.82	14.96	9.51	17.85	16.11	
Drugstore Managers and Pharmacists	M	130	Mean	71.98	36.10	72.12	84.21	44.42	44.27	16.19	71.35	49.81
		S.D.	18.05	8.67	11.88	16.45	11.94	12.40	8.45	16.08	12.10	

* Data for the other groups were obtained from *The Revised Manual for the Kuder Preference Record* (Chicago: Science Research Associates, 1946).

by Kuder were similarly, but not to as great an extent, below the average of high school boys in Mechanical interests and above in Scientific and Social Service interests, but this group of adult men differed most outstandingly in having stronger preferences for Persuasive activities than do high school boys. That this difference is not a reflection solely of an age difference is indicated by the fact that the drugstore managers and pharmacists also deviate very strongly in the same direction from the average score on the Persuasive scale of 2,667 adult men whose averages are reported by Kuder. It is on this Persuasive scale that the most striking difference appears between the pharmacy freshman men and the adult drugstore managers and pharmacists. Only part of this difference may disappear as the pharmacy freshmen grow older; it may be that a substantial number of the pharmacy freshmen will find themselves temperamentally unfit for retail drugstore management because of insufficient interest in and preference for the Persuasive type of activity for which, it appears, the typical drugstore manager has a strong preference.

2. *Comparisons of pharmacy freshman women.*—The most outstanding deviation of the pharmacy freshman women from the averages of high school girls is that on the Scientific scale, where the pharmacy freshman women obtain a much higher average score. This average is still not quite as high, however, as that obtained by 18 women who were in the upper half of their class and in the latter part of their course in pharmacy, as reported by Kuder. The pharmacy freshman women were similarly far below the average of high school girls on the Persuasive scale whereas advanced female pharmacy trainees and adult women were much closer to the high school girls' average. The third outstanding deviation of the pharmacy freshman women is on the Clerical scale. Here again the pharmacy freshman women were strikingly below the average of high school girls, but the 18 advanced female pharmacy trainees were still further below this average while adult women were very similar to the high school girls.

3. *General conclusions.*—In general, as compared with the large numbers of high school boys and girls on whom Kuder bases his norms, it may be said that pharmacy freshman men are weaker in Mechanical and Clerical interests, and stronger in Scientific and Social Service interests. The same deviations appear in the averages of adult male drugstore managers and pharmacists, who also show a large positive difference in average scores on the Persuasive scale which is both not matched by the pharmacy freshmen and not altogether due to age. The pharmacy freshman women differ most strikingly from high school girls in possessing a much stronger average preference for Scientific activities and a much weaker preference for Persuasive and Clerical activities. The average scores of 18 advanced and superior women in pharmacy training are very similar to those of the pharmacy freshmen with the exception of the average score on the Persuasive scale. Here these 18 women do not differ appreciably from high school girls.

It appears from this preliminary examination of the results of the testing with the Kuder Preference Record that much of its initial promise has already been borne out. It seems possible on the basis of these results to say with some certainty that freshmen entering pharmacy may be sharply differentiated from unselected high school boys and girls, or from adults in general, on the basis of certain interest patterns. Pharmacy freshmen who deviate markedly from the patterns exhibited by most of their fellow students should be suspect on the grounds of temperamental unfitness. But it remains of course for careful and extensive follow-up studies of these pharmacy freshmen to determine whether these anticipated relationships of interests to success in and satisfaction with pharmacy will actually hold.

G. *Comparisons of Institutions by Districts*

Are there significant variations in the average scholastic ability of freshmen entering schools of pharmacy in the

various geographical districts of the United States? An answer to this question was obtainable when the frequency distributions of the institutions within each of the districts were combined into one. The clustering of institutions followed the district organization now provided by an arrangement between the American Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy. The state membership of the districts, as shown in Chart 1, is as follows:

- District No. 1** (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut)
- District No. 2** (New York, New Jersey, Delaware, Pennsylvania, Maryland, District of Columbia, Virginia, West Virginia)
- District No. 3** (North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Puerto Rico)
- District No. 4** (Illinois, Indiana, Kentucky, Michigan, Ohio, Wisconsin)
- District No. 5** (Iowa, Minnesota, Nebraska, North Dakota, South Dakota)
- District No. 6** (Arkansas, Kansas, Louisiana, Missouri, Oklahoma, Texas)
- District No. 7** (Idaho, Montana, Oregon, Washington, Wyoming, Alaska)
- District No. 8** (Arizona, California, Colorado, Nevada, New Mexico, Utah)

For each of these districts the descriptive statistics are given in Table 4, along with the rank of the district in terms of its mean on the given test. It should be noted that District 8 ranks consistently high on all five of the tests while District 3 ranks low on all the tests.

The question might be raised whether the variations in means among the districts might not have arisen through chance fluctuations in random sampling. The statistical methods of analysis of variance and correlation ratio were applied to determine the probability that such chance varia-

TABLE 4
Means and Standard Deviations of Test Scores by Districts

		DISTRICT NUMBER							
		1	2	3	4	5	6	7	8
A.C.E. Psychological Examination	N	247	1070	431	856	45	240	239	199
	Mean	105.65	108.60	87.25	109.60	98.10	92.90	110.10	114.85
	S.D.	23.20	24.98	25.10	23.35	19.25	24.10	20.50	21.15
	Rank of Mean	5	4	8	3	6	7	2	1
Co-operative English Test	N	246	917	405	863	110	240	239	197
	Mean	55.32	53.73	46.38	52.98	49.41	50.07	54.69	55.95
	S.D.	8.64	9.09	9.57	11.10	9.45	10.68	9.27	9.63
	Rank of Mean	2	4	8	5	7	6	3	1
Purdue Mathematics Training Test	N	247	1074	476	883	234	282	244	201
	Mean	35.11	34.62	28.54	33.86	31.46	25.74	31.86	34.66
	S.D.	11.76	11.80	9.36	10.64	10.92	8.60	10.84	11.28
	Rank of Mean	1	3	7	4	6	8	5	2
Purdue Physical Science Test	N	246	1073	472	835	232	366	317	201
	Mean	72.85	71.60	64.50	72.45	73.00	64.40	71.70	74.80
	S.D.	14.15	14.75	14.05	14.20	15.20	16.35	14.25	14.90
	Rank of Mean	3	6	7	4	2	8	5	1
Pharmacy Back-ground Test	N	246	1068	476	881	232	365	319	202
	Mean	28.28	26.40	23.34	28.80	27.38	26.24	26.48	28.52
	S.D.	5.38	7.34	7.14	6.52	5.48	7.04	5.72	6.04
	Rank of Mean	3	6	8	1	4	7	5	2

tion could account for the differences obtained. The resultant statistical measures, the "F" ratio and "epsilon," are shown in Table 5. These statistics indicate that the obtained variation among the means of the districts on all five tests could have occurred by chance much less than once in a hundred times. The variation among districts is therefore very significant in the statistical sense.

The educational significance of these differences among the districts in the average scholastic abilities of their pharmacy freshmen is readily apparent. There will be real difficulty in maintaining the same standards of achievement and training in districts whose freshmen differ so appreciably. There will be corresponding obstacles in the way of any attempt to enforce nationally uniform licensure or other professional requirements for the professional practice of pharmacy.

TABLE 5
Analyses of Variance and Correlation Ratios by Districts

Test	"F" Ratio	Epsilon	Probability That Obtained Differences among Districts Arose Only from Chance Fluctuations
A.C.E. Psychological Examination	58.26	.34	less than .01
Cooperative English Test	36.46	.28	less than .01
Purdue Mathematics Training Test	34.15	.24	less than .01
Purdue Physical Science Test	28.15	.22	less than .01
Pharmacy Background Test	34.51	.24	less than .01

V. Summary and Conclusions

The results of a battery of predictive tests administered to more than 3,200 freshmen entering some forty-odd schools of pharmacy in the fall of 1946 support the following major conclusions:

1. Pharmacy freshmen are at least equal in general scholastic ability to freshmen entering American colleges in general in the fall of 1946.
2. Schools of pharmacy differ widely in the scholastic ability of their freshmen and tend to have the same relative position among schools of pharmacy when ranked on the basis of median score on each of the tests.
3. Differences between freshman men and women are not consistently in favor of either sex. Several differences traditionally found between male and female college freshmen do not hold for pharmacy freshmen; this is especially striking with respect to mathematics training and scientific interests. But the pharmacy freshman men are superior to the women in "linguistic" abilities. Processes of selection and guidance, however informal and unorganized they may be, appear to have operated in determining the qualities of women entering schools of pharmacy.
4. With respect to average achievement in English (usage, spelling, vocabulary) pharmacy freshmen in the fall of 1946 as compared with freshmen entering colleges from 1932 to 1937 were (a) higher than freshmen entering junior colleges and teachers colleges, (b) slightly lower than freshmen entering liberal arts colleges, (c) considerably lower than freshmen entering pre-professional colleges. The pharmacy freshman averages were lower in those aspects of English achievement most dependent on recency of formal schooling than they were in vocabulary.
5. There are significant regional differences among schools of pharmacy with respect to the scholastic abilities of their freshmen. These differences are also relatively consistent from test to test.
6. The average interest patterns of pharmacy freshmen are sharply distinguishable from those of high school pupils and of adults in general, but correspond well with those of advanced women students in pharmacy and with those of male drugstore managers and pharmacists. Available evidence indicates, however, that male pharmacy freshmen lack the high scores on the Per-

sulsive scale that characterize adult drugstore managers and pharmacists, and that this may not be due solely to age differences.

VI. The Future of the Predictive Testing Program

It must follow from any real understanding of the rationale of the Predictive Testing Program that the results reported here are and can be only preliminary. The final accounting of the worth of these tests can be made only when their validity has been studied in terms of success in pharmacy. The data reported here have value as descriptions of the students entering schools of pharmacy in the fall of 1946. These descriptions have shown how the students entering schools of pharmacy compare with students entering American colleges in general and how the pharmacy freshmen differ among themselves when grouped according to sex, institutions, and geographical districts. There is strong presumptive evidence that these descriptions have been made in terms of highly relevant dimensions, i. e., general scholastic ability; achievement in English, mathematics, physical science, and pharmacy background; and strength of preferences for nine different kinds of activity. But the final evidence concerning the relevance of these dimensions will be available only after criterion measures have been obtained. The work now in progress on the development of comprehensive achievement examinations in pharmacy is therefore integrally related to the Predictive Testing Program. Only to the extent that the data here summarized and reported are eventually correlated with these and other measures of success in pharmacy training and in professional functioning will the full meaning of the Predictive Testing Program emerge.

This validation program⁴ will, in essence, consist of the correlation of these predictive data with the comprehensive achievement examinations and criteria emerging from other unit studies of The Pharmaceutical Survey. Not to carry

⁴H. H. Remmers and N. L. Gage, "Achievement and Predictive Testing in The Pharmaceutical Survey," *American Journal of Pharmaceutical Education*, XI (January 1947), 43-53.

through this validation program would defeat the major scientific and educational purposes of the Group B studies (Student Personnel Studies) of The Pharmaceutical Survey.

PART II

Intra-institutional Comparisons of Pharmacy Freshmen with Other Freshmen

At the suggestion of Dr. E. C. Elliott, Director of The Pharmaceutical Survey, an investigation was made of the differences in scholastic ability and achievement between freshmen entering schools of pharmacy and those entering other schools or curricula *within the same university*. In the spring of 1947 the following letter was sent to the deans of schools and colleges of pharmacy throughout the United States:

Dear Dean:

The Pharmaceutical Survey is seeking data that will enable comparisons of students in pharmacy with students in other curricula of American higher education. You will remember that the Predictive Testing Program of last fall made possible such comparisons on a *nation-wide* basis. A report of that program is now ready for press and will be sent to you as soon as possible. We are now seeking information for similar comparisons on an *institution-wide* basis.

Such information would result from a university-wide testing program in which all entering freshmen are required to take the same set of tests. It is known that such testing programs are carried out in most universities at the beginning of the freshman year. Consequently we are fairly certain that your University will have such data in some form.

The following specific information will meet our requirements:

1. The month and year in which the tests were given. If any choice is possible, we should prefer data on the classes entering in the fall of 1940 and in the fall of 1946.
2. The names, and forms or editions, of the test given.
3. The test scores of the entering students grouped by school or curriculum. Thus for each school or curriculum in your University we should like to have (a) the average and varia-

bility of the scores, or (b) a frequency distribution of the scores, or (c) a list of the scores. We shall then be able to compare the averages and variabilities of students entering pharmacy with those of students entering, say, liberal arts, pre-medicine, engineering or whatever other curricula are available at your University.

Needless to say, such comparisons should have great value in portraying the position of pharmacy in American higher education and in making possible more valid selection, guidance and education of prospective pharmacists.

It goes without saying that the anonymity of all institutions furnishing data will be strictly maintained.

Your cooperation in this phase of the Student Personnel Studies of The Pharmaceutical Survey will be most genuinely appreciated. We shall look forward with interest to your early reply.

Cordially yours,

(signed) H. H. Remmers, Director
Student Personnel Studies

Responses to this letter differed greatly in form and content. The majority of institutions furnished no usable data. Either they had no institution-wide testing program, or had made no record on the test scores of the schools or curricula into which their freshmen were going or had only pharmacy students, or had the data but no facilities for duplicating them and furnishing them to The Pharmaceutical Survey. Consequently, usable data were obtained from only twelve institutions. Following are brief paragraphs summarizing the data that were obtained from these institutions.

Individual Institutions

College A is part of a medium-size middlewestern university. It furnished frequency distributions for its entering freshmen in arts, commerce, journalism, unclassified curricula, and pharmacy. The tests used were the Cooperative English Mechanics of Expression, Test A, Form T; a locally constructed mathematics examination; and the A. C. E. Psychological Examination, 1946 edition. We computed arith-

metic means, medians, and measures of variability for each frequency distribution. Because of the lack of comparability among institutions the average of each school on each test was assigned a number to indicate its rank order among the averages, from highest to lowest. Since these numbers are ranks, 1 is highest, 2 is next highest, and so on. It will be noted from Table 6 that of the five curricula, the pharmacy freshmen were in the middle on the English test, and second highest on the mathematics examination and the Psychological Examination.

TABLE 6

College A: Ranks of Freshman Groups in Median Scores
on Various Tests, 1946

<i>Curricular Group</i>	<i>TEST</i>			
	<i>Cooperative English; Mechanics of Expression</i>	<i>A. C. E. Psychol. Exam.</i>	<i>Local Mathematics Test</i>	<i>Average Rank</i>
PHARMACY	3	2	2	2.3
Arts	5	3	1	3
Journalism	1	1	5	2.3
Commerce	4	4	4	4
Unclassified	2	5	3	3.3

College B is part of an eastern state university which furnished data concerning seven curricula in addition to pharmacy. The test used was the American Council on Education Psychological Examination and data were reported for the freshmen entering in 1942, 1943, 1944. Numbers of students, arithmetic means, and standard deviations were furnished for each curriculum in each of the three years, on the "Q," "L," and total scores of the test. It is apparent from Table 7 below that in all three years and on all three average scores, the groups of pharmacy freshmen had the lowest averages.

In this college of pharmacy, at any rate, the pharmacy freshmen were during these war years the poorest in average intellectual ability. The number of pharmacy freshmen in 1942 was forty-nine, in 1943 was forty-six, and in 1944, was forty-one.

TABLE 7

College B: Ranks of Freshman Groups in Mean Scores
on the A. C. E. Psychological Examination, 1942-1944

Curricular Group	Quantitative Score			Linguistic Score			Total Score			Average Ranks for Three Years of Total Scores
	1942	1943	1944	1942	1943	1944	1942	1943	1944	
PHARMACY	8	8	8	8	8	8	8	8	8	8
Arts	5	6	6	1	1	2	1	3	4	2.7
Science	2	5	3	3	3	3	3	6	3	4
Agriculture	6	2	2	7	4	1	7	1	1	3
Home Economics ..	7	4	4.5	2	2	5	4	5	5	4.7
Engineering	1	1	1	6	7	4	2	2	2	2
Business	4	3	4.5	4	5	7	5	4	7	5.7
Nursing	3	7	7	5	6	6	6	7	6	6.3

College C, in a middle southern university, furnished only a distribution, according to decile rank, of the Ohio State University Psychological Test scores in 1945 and 1946 for students who at the time of enrollment indicated pharmacy as their probably choice of major field. Table 8 below shows this distribution of decile ranks for these freshmen. In 1945, the median decile rank was 2.8; in 1946, it was 3.5. These figures should be compared with the median decile of 5.0 which by definition characterizes all the freshmen entering this university in the given years. The pharmacy freshmen were significantly below the average of their classmates.

TABLE 8
College C: Distributions of Decile Ranks of Pharmacy Freshmen on O. S. U. Psychological Test

<i>Decile</i>	<i>1945 Frequency</i>	<i>Decile</i>	<i>1946 Frequency</i>
10	0	10	1
9	1	9	3
8	2	8	1
7	2	7	3
6	3	6	5
5	4	5	6
4	6	4	9
3	10	3	6
2	5	2	6
1	7	1	5
—	—	—	—
	40		45
Median:	2.8	Median:	3.5

College D is part of a southern technical institute. From this institution we have data only on ten pharmacy freshmen entering in 1940. For this group, we have scaled scores on eight tests. Since the average scaled score for all freshmen was, by definition, 50.0, we can tell for these ten pharmacy freshmen whether they were above or below the average of their hundreds of classmates in the other curricula. Wherever the average scaled score of the pharmacy freshmen is below 50, they are below the all-freshmen average; median scaled scores above 50 are similarly above the all-freshmen average. The average scaled scores of the ten pharmacy freshmen on the eight tests are given in Table 9. The number of pharmacy freshmen involved in these data is of course too small for valid generalizations. These data obviously have very little utility for our present purposes.

TABLE 9

College D: Median Scaled Scores of 10 Pharmacy Freshmen
on Various Tests, 1940

<i>Test</i>	<i>Median Scaled Score (All-University Mean: 50.0)</i>
English Mechanics	47.5
Reading Comprehension	47.5
Verbal Ability	46.5
Contemporary Affairs	52.5
Social Studies	48.5
Natural Science	56.5
Mathematics	54.5
Quantitative Ability	53.5

College E is in a privately endowed university in a medium-size middlewestern city. This college furnished data for the freshmen entering in the fall of 1946 and in February 1947. Lists of scores were furnished for all freshmen on the A. C. E. Psychological Examination. We computed separate averages for the freshmen entering liberal arts, fine arts, commerce, education, and pharmacy. Table 10 below shows the rank of the median scores of each curricular group for the total, linguistic, and quantitative scores. For the group entering in September 1946, it is apparent that the freshmen in pharmacy consistently rank below those in liberal arts, commerce, and (except for the quantitative score) fine arts. The pharmacy freshmen, however, consistently rank above the education freshmen. In February 1947, the pharmacy freshmen had the lowest median score on the A. C. E. total score and the quantitative score. On the linguistic score they ranked third, below the commerce and liberal arts freshmen but above the fine arts and education freshmen. The number of pharmacy freshmen in February 1947 was, however, only sixteen and the median based on such a small number of cases is, of course, rather unreliable. The number of pharmacy freshmen

entering in the fall semester was ninety-seven, and the numbers entering the other curricula were also sufficiently high to yield rather reliable averages.

TABLE 10

**College E: Ranks of Freshman Groups in Median Scores
on the A. C. E. Psychological Examination**

<i>Curricular Group</i>	<i>Quantitative Score</i>		<i>Linguistic Score</i>		<i>Total Score</i>		<i>Average Ranks, Two Years' Total Score</i>
	<i>Sept. 1946</i>	<i>Feb. 1947</i>	<i>Sept. 1946</i>	<i>Feb. 1947</i>	<i>Sept. 1946</i>	<i>Feb. 1947</i>	
PHARMACY	3	5	4	3	4	5	4.5
Liberal Arts	2	2	1	2	1	2	1.5
Fine Arts	4	4	3	5	3	4	3.5
Commerce	1	1	2	1	2	1	1.5
Education	5	3	5	4	5	3	4.0

College F is part of an eastern university largely state-supported and fairly close to the New York metropolitan area. In 1940 this institution admitted forty-seven pharmacy freshmen. Table 11 shows that the mean score in 1940 of the pharmacy freshmen was the third highest among eight curricula, being surpassed by the freshmen entering chemistry and ceramics, but higher than the mean scores of the freshmen entering education, arts and sciences (other than biology and chemistry), biology, engineering (other than ceramic engineering), and agriculture. In 1946 this institution admitted eighty-four pharmacy freshmen whose mean score on the Ohio State University Intelligence Test was the sixth highest among eight curricula. The freshmen entering chemistry, engineering (other than ceramics), biology, arts and sciences (other than biology and chemistry), and ceramics achieved higher mean scores than did the pharmacy freshmen. The freshmen entering agriculture and education had lower mean scores than the pharmacy freshmen.

TABLE 11

College F: Ranks of Freshman Groups in Median Scores
on Scholastic Ability Tests, 1940 and 1946

Curricular Group	1940 A.C.E. Psychological Exam.	1946 O.S.U. Intelligence Test	Average Rank, Two Years
PHARMACY	3	6	4.5
Arts and Science (less Biology and Chemistry)	5	4	4.5
Biology	6	3	4.5
Chemistry	1	1	1
Agriculture	8	7	7.5
Engineering (less Ceramics)	7	2	4.5
Ceramics	2	5	3.5
Education	4	8	6

College G is part of a large middlewestern state university. This institution furnished decile equivalents for freshmen in liberal arts, engineering, pharmacy, and nursing on various tests given in the fall of 1940 and on other tests given to freshmen entering in 1946. The ranks of the median scores of these four groups on the various tests in 1940 and 1946 are shown in Table 12 below. In 1940 the pharmacy freshmen ranked below the nursing and liberal arts freshmen but above the engineering freshmen on the Iowa English Training Test. Similarly, among the four curricula, the pharmacy freshmen ranked third or fourth on the other five tests, surpassing only the nursing freshmen on two of the tests. In 1946, it was possible to make comparisons only with the nursing and liberal arts freshmen. (The liberal arts freshmen had taken these tests in 1940.) In this year the pharmacy freshmen were the lowest of the three groups on the Effectiveness of Expression Test and on the Interpretation of Literary Materials Test. But they were higher than the 1946 nursing freshmen or the 1940 liberal arts freshmen on the Interpre-

TABLE 12

College G: Ranks of Freshman Groups in Median Scores on Various Tests, 1940 and 1946

Curricular Group	1940						1946						Average Ranks, Two Years
	Iowa English Training, 1940	Iowa Math. Attitude	Co-op. Reading— Comprehension, C-2	Iowa H. S. Content	Composite %ile Iowa Qual. Exam.	Effectiveness of Expression	Interp. of Reading : Social Studies	Interp. of Reading : Natural Science	Interp. of Literary Materials	General Math. Ability, Form Y			
PHARMACY	3	3	4	3	4	3	1	1	3	1	2.6		
Liberal Arts	2	2	1	2	2	2	3	3	2	3	2.2		
Engineering	4	1	2	1	1	1					1.8		
Nursing	1	4	3	4	3	1	2	2	1	2	2.3		

tation of Reading in the Natural Sciences Test, and on the General Mathematical Ability Test.

College H is part of another large middlewestern state university. Appropriate data from this institution were available only for the class entering in the autumn of 1940. The test scores in this university had not been broken down in September 1946 into the different college groups. Comparisons of pharmacy freshmen were possible with agriculture, arts and science, business, engineering, teachers college, miscellaneous, and unclassified freshmen. Table 13 shows the ranks of the medians of the various freshman groups on each of seven test scores. The pharmacy freshmen ranked about in the middle of all the groups on all the tests except the local English Test. On this test the pharmacy freshmen were the lowest ranking group.

College I is also part of a large middlewestern state university. For this institution data were available on the class entering in September 1946. The measures used were the

TABLE 13

College H: Ranks of Freshman Groups in Median Scores
on Various Tests, 1940

<i>Curricular Group</i>	<i>Local English Test, Form XII</i>	<i>O. S. U. Intell. Test, Form 20; Reading Comprehension</i>	<i>A. C. E. Psych. Total Score</i>	<i>A. C. E. Psych. Quantitative Score</i>	<i>A. C. E. Psych. Linguistic Score</i>	<i>Local Arithmetic Test</i>	<i>Local Algebra Test</i>	<i>Average Ranks, Five Tests, Total Scores</i>
PHARMACY	8	3	4	5.5	4.5	4	4	4.6
Agriculture	5	6	7	5.5	7	4	4	5.2
Arts and Science ...	1	1.5	2	3	1	4	4	2.5
Business	6	4	3	2	3	2	2	3.4
Engineering	3.5	1.5	1	1	2	1	1	1.6
Teachers College ...	2	6	5	4	8	8	8	5.8
Miscellaneous	3.5	8	8	7.5	6	6.5	7	6.6
Unclassified	7	6	6	7.5	4.5	6.5	6	6.3

A. C. E. Psychological Examination (1937 edition), the Co-operative English Test (1938 form) and also the high school percentile rank of the entering freshmen (percentage of students in his high school class above whom the freshman ranked). The ranks of the arithmetic means of the various curricular groups on these three measures are shown in Table 14 below. Separate data were furnished for each sex as well as for the total group of freshmen. Considering only the men, we find the beginning pharmacy students the third highest in their average high school percentile rank, third highest on the Psychological Examination, and third highest on the Cooperative English Test. In each case, they were surpassed by the freshmen entering the engineering and liberal arts curricula. The pharmacy freshmen were, however, superior in average high school percentile rank and the two

TABLE 14
**College I: Ranks of Freshman Groups in Means
of Various Measures, 1946**

<i>Curricular Group</i>	<i>High School Percentile</i>			<i>A.C.E. Psych. Exam.</i>			<i>Coop. English</i>			<i>Average Ranks</i>
	Men	Women	Total	Men	Women	Total	Men	Women	Total	
PHARMACY	3	1	5	3	1	4	3	2	5	4.7
Agriculture and Forestry	4		6	4		5	4		6	5.7
Home Economics		5			4			5		
Education	5	6	7	5	5	7	5	6	7	7
General	6	7	8	6	7	8	6	7	8	8
Engineering	1		4	1		1	2		4	3
Science and Arts ..	2	3	3	2	2	2	1	1	2	2.3
Dental Hygiene ..	4	2		6	6		4	3		2.7
Nursing	2	1		3	3		3	1		1.7

test scores to freshman men entering agriculture and forestry, education, and the general education curricula. Considering the women only, those entering pharmacy had the highest average high school percentile ranks and Psychological Examination scores and the second highest average English Test scores, being surpassed on this latter only by the women entering the liberal arts school. When the men and women are considered together, the total group of pharmacy freshmen ranks fifth as to average high school percentile rank, being surpassed by the nursing, dental hygiene, liberal arts, and engineering freshmen. On the Psychological Examination, the total group of pharmacy freshmen ranks fourth, being surpassed by the engineering, liberal arts, and nursing. On the English Test, the total group of pharmacy freshmen ranked fifth, being surpassed by the nursing, liberal arts, dental hygiene, and engineering freshmen.

College J, part of an eastern urban university, furnished data from the A. C. E. Psychological Examination for the

TABLE 15

College J: Ranks of Freshman Groups in Median Scores
on Various Tests, 1935-1939 and 1946

Curricular Group	A. C. E. Psychol. Exam.						Coop. Engl. Test 1946	Avg. Ranks All Years
	1935	1936	1937	1938	1939	1946		
PHARMACY	2	3	2.5	3	3	2	2	2.5
Arts	1	1	1	1	1	1	1	1
Business Administration	3	2	2.5	2	2	3	3	2.5

years 1935 through 1939, and for 1946. It also furnished data on the Cooperative English Test for the freshmen entering in 1946. Comparisons of pharmacy freshmen with those entering the arts college and the business administration curriculums were possible with the data furnished. Table 15 below shows the ranks of the median scores on these tests of the three curricular groups in the various years.

It is evident that during the pre-war years the pharmacy group consistently ranked below the arts college group in median score on the Psychological Examination. In 1946, the pharmacy group's median score was again below that of the arts college freshmen but was slightly higher than that of the freshmen entering business administration. In 1946, also, the pharmacy freshmen ranked below the arts college freshmen on the Cooperative English Test but higher than the business administration freshmen.

College K is in a middlewestern state university. It furnished data on freshmen entering in September 1942 and September 1945. The tests used were the A. C. E. Psychological Examination and locally constructed tests in English, mathematics and physical science. Table 16 shows the ranks of the mean scores on these tests for the various curricular groups. It is evident that the pharmacy freshmen consistently ranked below those entering engineering and science and also, on the Psychological and English tests, below those

TABLE 16

College K: Ranks of Freshman Groups in Mean Scores on Various Tests, 1942 and 1945

<i>Curricular Group</i>	A. C. E. Psychol. Exam.		Placement Test in English		Math. Training Test			Physical Science Test	Avg. Ranks
	1942	1945	1942	1945	1942	July 1945	Oct. 1945	1945	
PHARMACY	5	5	6	5	4	4	4	4	4.6
Engineering	2	2	3	3	1	1	1	1	1.8
Science—Men	3	3	4	4	2	2	3	2	2.9
Science—Women ...	1	1	1	1	3	3	2	3	3.1
Home Economics ...	4	4	2	2	*	6	6	7	4.4
Agriculture	6	6	5	6	6	5	5	5	5.5
Physical Education ..	8	7	8	7	7	7	7	6	7.1
Trade and Industrial Education	7	*	7	*	5	*	*	*	6.3

* Too few cases for consideration.

entering home economics (almost entirely women). The pharmacy freshmen generally ranked above those entering agriculture, physical education, and trade and industrial education.

College L is part of a northwestern agricultural college. It furnished data concerning the A. C. E. Psychological Examination scores of its freshmen in the fall of 1946. Table 17 shows the rank of its six curricular groups. The pharmacy freshmen ranked third, below the chemistry majors and engineers and above the home economics and agriculture groups.

General conclusions.—To bring together in summary form the comparisons of the foregoing tables, we have constructed Table 18. Here are shown the numbers of comparisons in which pharmacy freshmen achieved average test scores above, equal to, or below those of freshmen in the various other curricular groups. It was possible to include information

TABLE 17

College L: Ranks of Freshman Groups in Mean Scores
on the A. C. E. Psychological Examination, 1946

<i>Curricular Groups</i>	<i>Rank of Mean Score</i>
PHARMACY	3
Chemistry (Majors)	1
Engineering	2
Home Economics	4
Agriculture	5

from only ten institutions in this table, since the data from Colleges C and D did not show specific curricular groups other than pharmacy.

Table 18 shows that, of ten instances in which it was possible to compare the average rank of pharmacy freshmen with arts and science freshmen, the pharmacy freshmen ranked below in eight, equal in one, and above the arts and science freshmen in one. Similarly, out of seven comparisons, pharmacy freshmen ranked below engineering in six and equal in one. Pharmacy freshmen ranked below commerce and business administration freshmen in three out of five comparisons. On the other hand, pharmacy ranked above agriculture freshmen and above education freshmen in four out of five comparisons. For the remaining curricula fewer than five comparisons were possible.

We can conclude on the basis of these data, heterogeneous as they are with respect to year, tests, institutions and curricula, that pharmacy freshmen were, in the years here considered, generally inferior to arts and science and engineering freshmen and generally superior to agriculture and home economics freshmen in their performance on tests of scholastic ability and achievement.

TABLE 18

Comparison of Average Ranks of Pharmacy with All Other Curricula in Ten Institutions

<i>Curricular Group</i>	<i>Number of Comparisons of Average Ranks in Which Pharmacy Ranked</i>			
	<i>Below</i>	<i>Equal</i>	<i>Above</i>	<i>Total</i>
Arts and Science	8	1	1	10
Engineering	6	1	—	7
Commerce	3	1	1	5
Agriculture	1	—	4	5
Education	1	—	4	5
Home Economics	2	—	2	4
Nursing	3	—	—	3
Chemistry	2	—	—	2
Miscellaneous and Unclassified	—	—	2	2
Journalism	—	1	—	1
Fine Arts	1	—	—	1
Biology	—	1	—	1
Ceramics	1	—	—	1
General	—	—	1	1
Dental Hygiene	1	—	—	1
Physical Education	—	—	1	1
Total	29	5	16	—

PART III

*Preliminary Validation of the Predictive Tests against
First Semester Average Grades*

In order to obtain some notion of the extent to which the tests used in the Predictive Testing Program in the fall of 1946 could actually predict success in pharmacy, it was con-

sidered desirable to set up first semester grades in schools of pharmacy as a first approximation to an adequate criterion of success. With this in mind, we sent the following letter to the deans of colleges of pharmacy in the spring of 1947:

Last fall your institution was one of 54 schools of pharmacy throughout the United States that participated in the Predictive Testing Program of The Pharmaceutical Survey. As you are probably aware in general and as explained in further detail in the paper by Mr. N. L. Gage and myself in the January 1947 number of the *American Journal of Pharmaceutical Education* (pages 54-62), the full meaning of these predictive tests will not emerge until they have been validated against criteria of success in pharmacy. The Pharmaceutical Survey is now undertaking to develop comprehensive achievement examinations at the senior level in pharmacy. It is anticipated that these examinations will furnish a criterion far superior in validity and reliability to any now available.

But since this program will not reach fruition until the spring of 1950, when the freshmen tested last fall will be graduating seniors, we are interested in securing preliminary criterion data in the form of instructor's marks. We are therefore writing to request such data from you. What we need is substantially a list of the names of your freshmen who were tested in the Predictive Testing Program last fall and the semester grades given to these freshmen by their instructors at the end of the fall semester or first quarter after they took those tests. We shall undertake to combine these grades into a composite index and to compute the various statistical measures which will indicate how well these grades could have been foretold from their scores on the predictive tests. A report on our findings will of course be furnished to you without charge.

Enclosed are sufficient copies of a form which we think will facilitate the work at your institution involved in furnishing these data to us. We shall of course be happy to answer any questions you may have about this procedure and especially some early indication from you of when we may expect to have these data.

You will be interested to know that plans of The Survey contemplate the repetition of the Predictive Testing Program for the freshmen entering next fall.

Cordially yours,

(signed) H. H. Remmers, Director

Student Personnel Studies

Thirty-seven institutions responded to this letter with rosters of grades obtained in first semester courses by freshmen in their schools of pharmacy. For each of these institutions, the grades were combined in one of various ways to obtain a composite index of scholastic success in the first semester.

For some institutions, the grades were weighted by the number of credits or semester-hours that each course carried. In other institutions, where all courses carried the same or approximately the same credit ratings, this weighting was not done; rather, the numerical values of the grades were simply totaled and divided by the number of courses involved. In other words, for each institution a composite first semester or quarter grade index was obtained in the fashion that seemed most valid, either weighted or unweighted, for that institution.

Each of the predictive tests was then correlated with the composite grade point index for each institution. These correlations, with the number of students involved in each, are shown in Table 19. The numbers of the institutions are the same as those used in the body of this report.

In Table 20 the same information is shown for the nine scales of the Kuder Preference Record.

In order to portray the distribution of these correlation coefficients for each test against grade point averages, frequency distributions of the correlation coefficients for each test were made. These are shown in Table 21. The numbers of coefficients for the various tests differ from one another because not every test was used in all of the schools reporting data. The median coefficient of correlation, as computed from these frequency distributions of coefficients, is approximately .5 for all of the tests except the Pharmacy Background Test, whose median coefficient of correlation is .22.

As is well known, however, it is not only the correlation of each individual test with the criterion that determines

TABLE 19
Correlations by Schools of Predictive Test Scores
vs. Grade Point Averages in Fall Semester, 1946

School Number	A. C. E. Psychol. N r	Purdue Physical Science N r	Coop. English N r	Purdue Math. Training N r	Pharmacy Backgrd. N r
1	81 .402	83 .605	81 .318	82 .484	83 .056
2	118 .186	125 .276	120 .220	126 .426	125 -.020
3	93 .288	93 .323	92 .376	93 .438	92 .563
5	39 .390	39 .480	39 .461	39 .584	39 .088
7	62 .651	60 .365	62 .487	62 .445	63 .360
8	71 .488	71 .511	71 .497	71 .724	71 .031
9	44 .580	44 .645	44 .576	44 .528	44 .219
10	60 .331	63 .267	63 .316	63 .532	63 .257
11	81 .390	82 .230		83 .531	81 .102
12	78 .323	77 .190	78 .280	77 .265	76 -.117
13	42 .244	42 .530	42 .433	41 .470	42 .154
16	52 .625	52 .539		52 .582	52 .335
17	76 .306	75 .517	76 .386	75 .475	75 .064
19	137 .524	137 .482	137 .516	137 .423	137 .175
20	172 .652	171 .641	171 .577	171 .647	169 .227
21	59 .510	56 .537	59 .375	56 .438	56 .152
22	68 .505	66 .416			67 .300
23	95 .248	95 .431	95 .489	95 .496	95 .388
24	80 .486	80 .408	80 .517	81 .435	80 .060
25	37 .309	37 .297		37 .282	37 -.084
26	24 .402	25 .625	24 .481	25 .646	25 .298
28	50 .637	50 .472	50 .568	50 .576	50 .380
29	22 .698	23 .632	22 .591	23 .685	23 .434
30	42 .470	42 .559	43 .505	43 .619	43 .142
32	80 .686	81 .671	81 .531	79 .568	81 .224
33	72 .547	73 .464	72 .643	73 .621	73 .236
37	14 .394	16 .618	14 .330	16 .803	16 .057
38	43 .533	45 .282	44 .594	45 .472	45 .043
39	30 .620	29 .571	30 .675	29 .590	29 .387
40	23 .474	25 .693	23 .509	25 .315	25 .328
41	26 .623	24 .621	23 .587	24 .489	21 .478
44		57 .451	57 .441	58 .544	58 .207
45	75 .575	73 .627	59 .552	74 .400	72 .089
46		82 .422			79 .470
47		39 .218		39 .387	39 -.103
48		100 .365		100 .287	100 .274

TABLE 20
Correlations between Kuder Preference Record Scores and First Semester Average Grade

School Number	Mechanical	Computational	Scientific	Per-suasive	Artistic	Literary	Musical	Social Service	Clerical
N	1	2	3	4	5	6	7	8	9
5	.39	-.041	-.004	-.032	-.102	-.229	.183	.064	-.273
7	.61	-.183	-.097	-.145	-.158	.145	-.118	.015	.113
11	.82	-.106	.102	.154	-.087	.268	.195	-.062	-.179
21	.59	-.008	-.204	-.224	-.029	.095	-.134	-.096	-.200
22	.68	-.092	.056	.075	-.088	-.358	-.123	-.136	-.102
24	.79	-.224	-.036	-.172	-.140	-.082	-.054	-.103	-.073
25	.37	.184	.247	.175	-.013	-.198	.158	-.308	.113
29	.22	.251	-.077	.191	-.048	-.289	.128	-.139	.057
30	.43	-.012	.280	.221	-.326	.211	.250	.239	-.341
39	.30	.000	.332	.331	-.275	-.020	.170	-.143	-.033

TABLE 21

Frequency Distributions of r's between the Various Tests
and First Semester Grade Point Averages

<i>r with Average Grade</i>	<i>A. C. E. Psychol.</i>	<i>Coop. English</i>	<i>Physical Science</i>	<i>Math. Training</i>	<i>Pharm. Backgrd.</i>
.800— [†] .849				1	
.750— .799				—	
.700— .749				1	
.650— .699	4	1	2	—	
.600— .649	4	2	8	5	
.550— .599	2	6	2	5	1
.500— .549	5	5	5	4	—
.450— .499	4	5	5	6	2
.400— .449	2	2	4	7	—
.350— .399	3	3	2	1	5
.300— .349	4	3	1	1	3
.250— .299	1	1	4	3	3
.200— .249	2	1	2		5
.150— .199	1		1		3
.100— .149					2
.050— .099					6
.000— .049					2
-.001— -.049					1
-.050— -.099					1
-.100— -.149					2
Total r's	32	29	36	34	36
Median r488	.490	.500	.492	.220

how efficient a group of tests will be for predicting the criterion, but it is also necessary to consider the intercorrelations of the tests themselves. That is, in ascertaining the predictive value of a battery of tests, it is necessary to compute coefficients or multiple correlation and the magnitude of these depends upon both the correlations of the tests with the criterion and the intercorrelations of the tests with one another. It is mathematically demonstrable that the most predictive group of tests is that whose correlations with the criterion are as high as possible and whose correlations with one another are as low as possible. To secure low intercor-

relations, we need tests that measure aspects of individuals that are relatively independent of one another; the more independent the tests, the more separate aspects of individuals we are measuring. And the more each of these aspects is related to the success we are predicting, the more accurate our predictions will be.

These considerations are all taken into account by means of a procedure for selecting the most efficient battery of tests known as the Wherry-Doolittle Test Selection Method. This method has been described as follows:

This is a method for selecting a battery of tests that will give the maximum shrunken multiple correlation with the criterion; that is, the maximum multiple correlation after a correction has been made for the chance error added by each test. The tests are selected in the order of their contribution to the multiple.

As a rule, the increase in the multiple becomes less and less, while at the same time the chance error increases. Finally the point is reached where the addition of another test adds more chance error than actual validity to the battery. Application of the Wherry shrinkage formula after the addition of each test will show when this point has been reached and no further test additions are feasible.¹

This method has here been applied to the coefficients of validity and intercorrelation of the tests in each of eight schools of pharmacy. These eight schools have been selected as falling at approximately equal intervals on the range of average scores of the schools on the A. C. E. Psychological Examination. Since they were selected in this manner, these eight schools of pharmacy represent roughly all levels of average scholastic ability that characterize the freshmen in the various institutions.

In Table 22 are shown, for all eight institutions, the inter-correlations and validity coefficients of the five tests with first semester average grades.

¹ "The Wherry-Doolittle Test Selection Method," in W. H. Stead, C. L. Shartle, and Associates, *Occupational Counseling Techniques: Their Development and Application* (New York: American Book Co., 1940), Appendix 5.

TABLE 22
Intercorrelations and Validity Coefficients of Predictive Tests
and First Semester Average Grades in Eight
Schools of Pharmacy

	College Number	Coop. Engl. Test	Purdue Math.	Purdue Phys. Sci.	Pharm. Backgrd.	First Sem. Avg. Grade
A. C. E.	1	.712	.467	.729	.309	.402
Psychol.	5	.748	.294	.556	.460	.390
Exam.	10	.649	.447	.610	.459	.331
	20	.680	.525	.701	.236	.652
	30	.775	.497	.753	.424	.470
	40	.780	.511	.694	.070	.474
	41	.616	.679	.456	.641	.623
	50	.669	.403	.409	.279	.533
Coop. Engl. Test	1		.213	.437	.166	.318
	5		.352	.477	.296	.461
	10		.182	.271	.232	.316
	20		.413	.588	.248	.577
	30		.407	.683	.469	.505
	40		.339	.572	.196	.509
Purdue Math.	41		.471	.630	.407	.587
	50		.168	.278	.240	.370
	1			.649	.004	.484
	5			.545	-.084	.584
	10			.682	.324	.532
	20			.661	.113	.647
Purdue Phys. Sci.	30			.585	.173	.619
	40			.513	.286	.315
	41			.656	.376	.489
	50			.566	.368	.557
	1				.262	.605
	5				.459	.480
Pharmacy Background	10				.611	.267
	20				.278	.641
	30				.540	.559
	40				.104	.693
	41				.649	.621
	50				.421	.333
1						.056
5						.088
10						.257
20						.227
30						.142
40						.328
41						.478
50						.224

In Table 23 are shown the results of the applications of the Wherry-Doolittle Test Selection Method to these eight tables of intercorrelations. It will be noted that these multiple correlations range from .611 to .757 and that their median is approximately .65.

TABLE 23
Multiple Correlations of Predictive Test Battery
vs. First Semester Average Grades

College Number	Shrunken Multiple Correlation	No. of Students	Test in Order of Inclusion in Most Predictive Battery
1	.611	86	Phys. Science, Math.
5	.634	44	Math., English
10	.612	89	Math., English, Phys. Science, Pharm. Background
20	.757	177	Psychol., Math., English, Phys. Science
30	.669	46	Math., English
40	.726	24	Phys. Science, Pharm. Background
41	.712	25	Psychol., Phys. Science, Math.
50	.643	59	Math., Psychol.

In order to secure some notion of the values of the individual tests, the number of batteries in which each test was included can be summarized as follows. Of the eight schools in which certain combinations of tests were selected as most predictive, by the Wherry-Doolittle Test Selection Method, the Purdue Mathematics Training Test was included for six; the Purdue Physical Science Test was included for five; the Cooperative English Test was included for four; the A. C. E. Psychological Examination was included for three; and the Pharmacy Background Test was included for two.

The combination of tests that proved most predictive in each institution is probably a function of the courses or sub-

jects that are included in the first semester's or quarter's curriculum in each institution. *If these eight colleges of pharmacy, ranging from highest to lowest in average freshman performance on the Psychological Examination, are accepted as a fairly representative sample, then it would appear that the Mathematics, Physical Science, and English Tests are most generally suitable for predicting first semester grades in colleges of pharmacy.*

It appears that the present battery of tests provided a set of measures that are as predictive of first semester grades in colleges of pharmacy as any set of tests is ordinarily found to be predictive of first year college grades. This means that the original selection of tests for the Predictive Testing Program battery is about as valid as could be expected in terms of such a criterion. The far from perfect reliability and validity of this criterion, instructor's marks, should of course be kept in mind in considering the ultimate possibilities of this battery of predictive tests. For, as is well-known, this criterion is far from being the best possible. As the reliability and validity of the criterion are increased, it will be possible to secure higher coefficients of multiple correlation between the battery of predictive tests and success in pharmacy. In other words there seems to be evidence in these data, as was expected, that predictions of success in pharmacy in terms of college grades can be made as readily as for most other college curricula and with about the same degree of validity. Prediction by means of the present battery of tests with freshmen grades as the criterion, assuming a validity coefficient of .65, would be approximately 24 per cent better than chance. That is, we will have 24 per cent less error if we make our predictions by means of this battery of tests than if the predictions were made solely on a chance basis. Since chance alone would place a considerable proportion of the students in their correct classification on the criterion, this improvement over chance represents prediction of substantial value. If, however, we had a perfectly reliable criterion and not one whose reliability is only about .70, our index of forecasting efficiency would be 37 per cent, that is,

37 per cent more accurate than if the predictions were made on the basis of chance alone.²

This argument is similar to that already expressed by us in our statement of the rationale for the achievement and predictive testing programs of The Pharmaceutical Survey. It is to realize upon the potentialities of more reliable and valid criteria that we have continually placed greatest emphasis upon the development of comprehensive achievement examinations in pharmacy as a substitute for instructor's marks in judging success in the pharmacy curriculum.

The ultimate criterion of success should, of course, be the effectiveness of the pharmacist as a professional practitioner and a citizen. The need exists, therefore, for developing criteria of success in terms of what the practicing pharmacist actually does and should do. Various unit studies of The Pharmaceutical Survey should contribute materially to the more valid definition of success in pharmacy.³

Apart from the major improvement in prediction that can be obtained from increased criterion reliabilities, there is also in all likelihood room for improvement in the choice of predictive measures. As indicated in the Wherry-Doolittle Test Selection Method, not all five of the tests in the present batteries were ever necessary to maximize the prediction of first semester grades. The relatively high intercorrelations among these five measures indicate that the battery is relatively inefficient. The tests, in other words, overlap too much and measure the same aspects of students to too great an extent. This shortcoming of the present battery could be eliminated in future predictive testing programs through the selection of tests that are less complex, more "factorially pure". Such tests might have lower individual correlations with the criterion than do the present tests. But it is quite likely that

² This estimate was made by means of a table prepared by H. S. Conrad and G. B. Martin, "The Index of Forecasting Efficiency for the Case of a 'True' Criterion," *Journal of Experimental Education*, IV (1936), 231-44.

³ For titles of relevant unit studies see our "Achievement and Predictive Testing in the Pharmaceutical Survey," *American Journal of Pharmaceutical Education*, XI (1947), 43-53.

their intercorrelations would also be substantially lower so that the multiple correlation of the entire battery would be higher than those obtained with the present group of tests. Such a battery would ideally have no "dead weight" since all the tests, when examined by the Wherry-Doolittle Test Selection Method, would prove to make positive contributions to the prediction of the criterion. It is such a battery of tests that we strongly recommend be investigated for use in future predictive test batteries in pharmacy.

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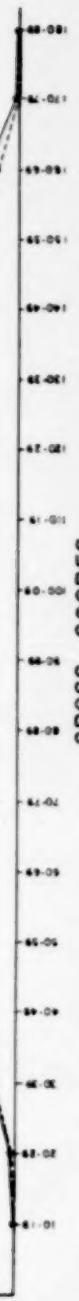




CHART NO. 1



A.C.E. PSYCHOLOGICAL EXAMINATION FOR COLLEGE FRESHMEN
CHART NO. 2



— = 18,763 STUDENTS IN 95 COLLEGES MEAN = 102.77 MEDIAN = 102.64 S.D. = 24.02
— = 3326 PHARMACY FRESHMEN MEAN = 105.15 MEDIAN = 106.20 S.D. = 25.15

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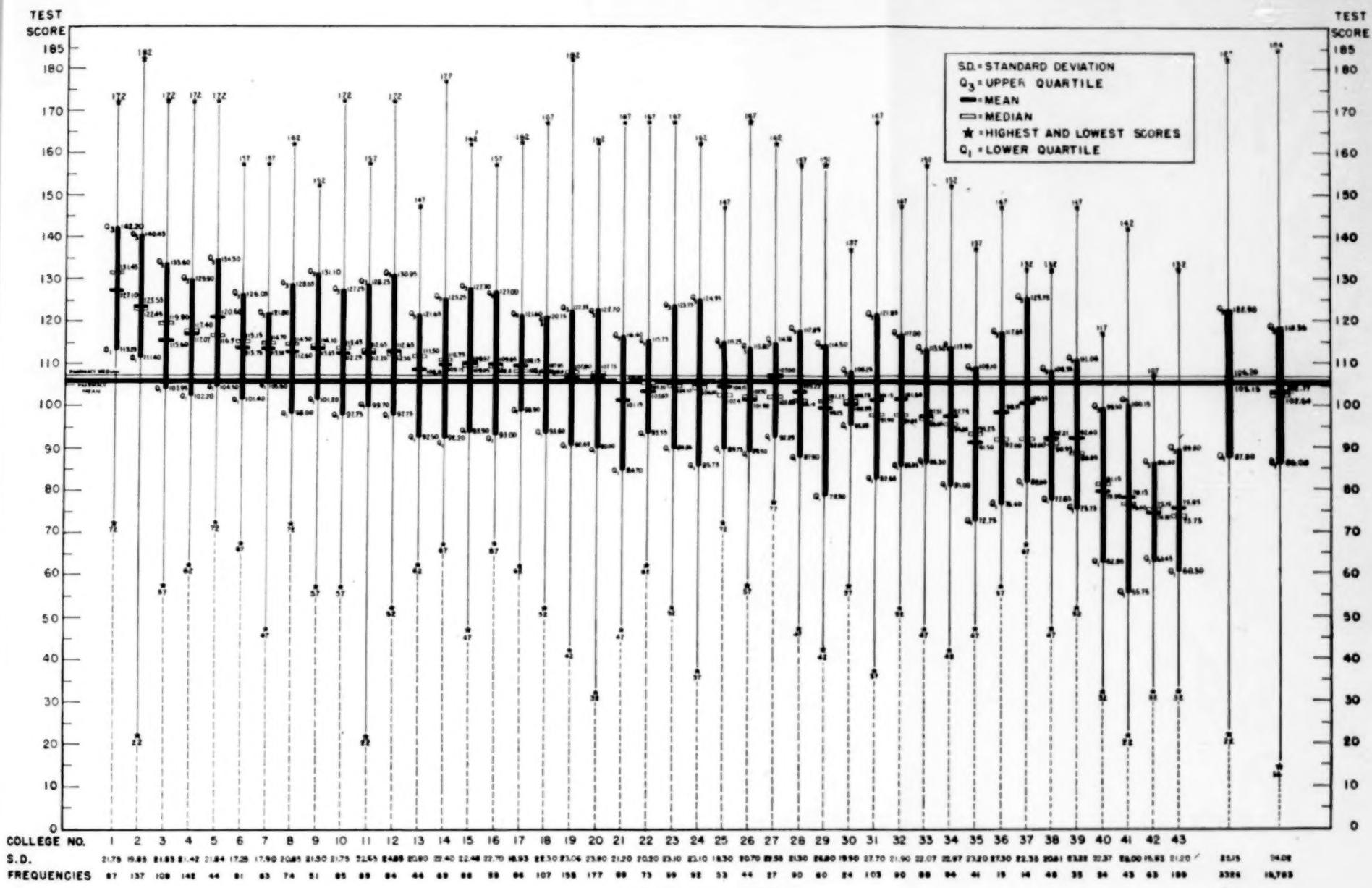
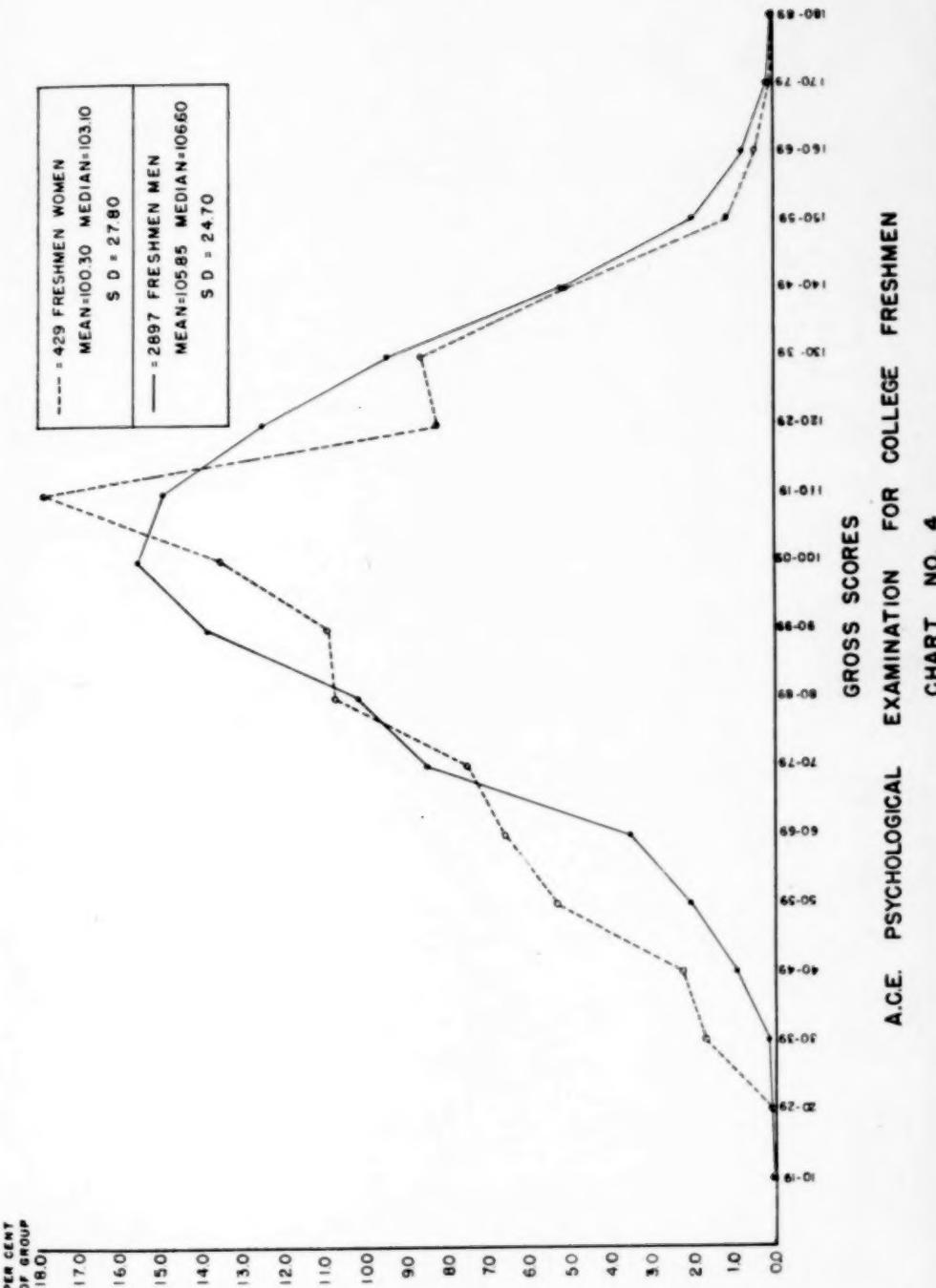


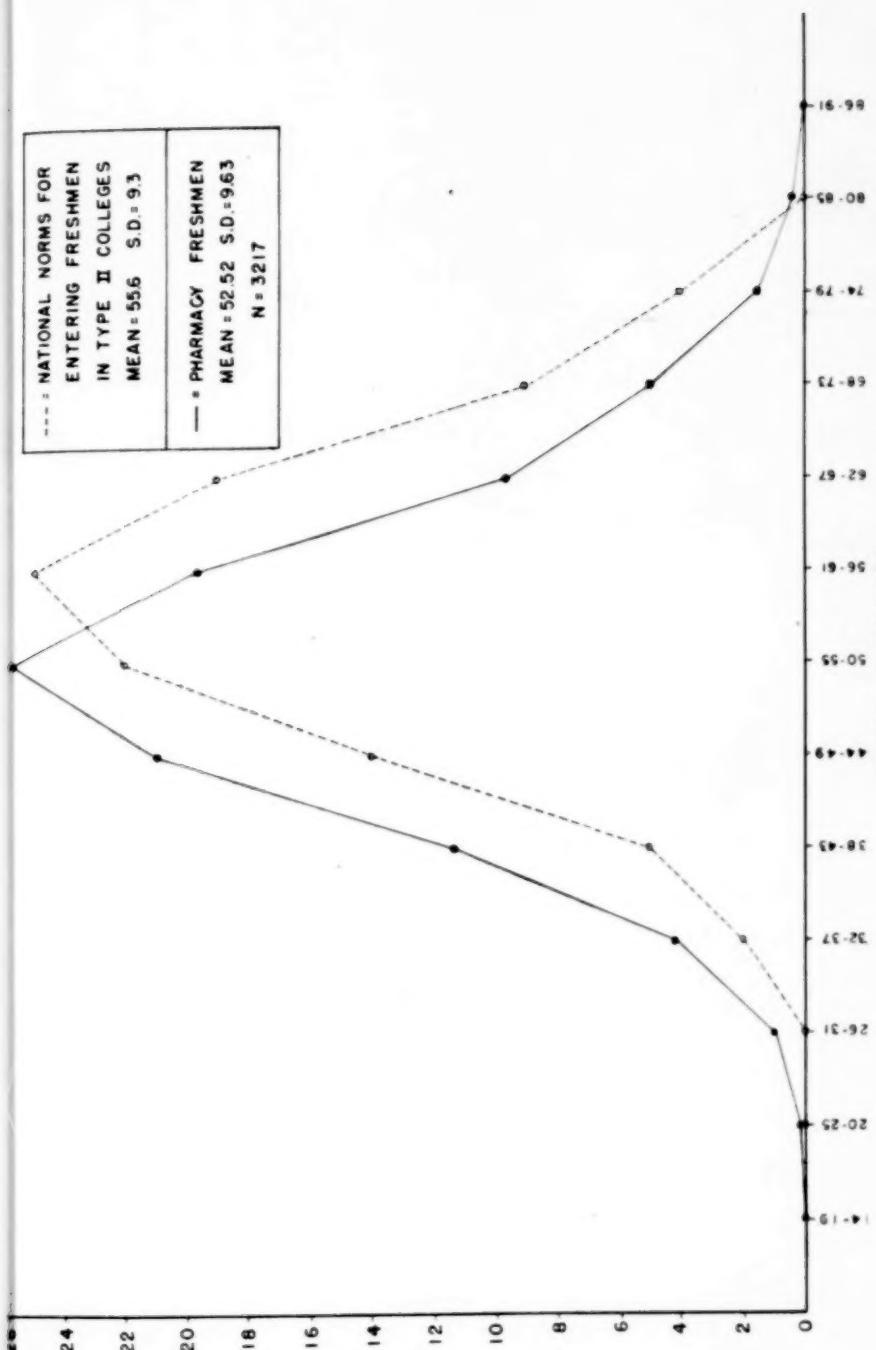
CHART NO. 3
 A.C.E. PSYCHOLOGICAL EXAMINATION FOR COLLEGE FRESHMEN
 GROSS SCORES BY INSTITUTIONS

SUMMARY OF ALL
 SCHOOLS A.C.E.
 SCORE
 A.C.E. NATIONAL
 SCORE





COOPERATIVE ENGLISH TEST, FORM PM
CHART NO. 5



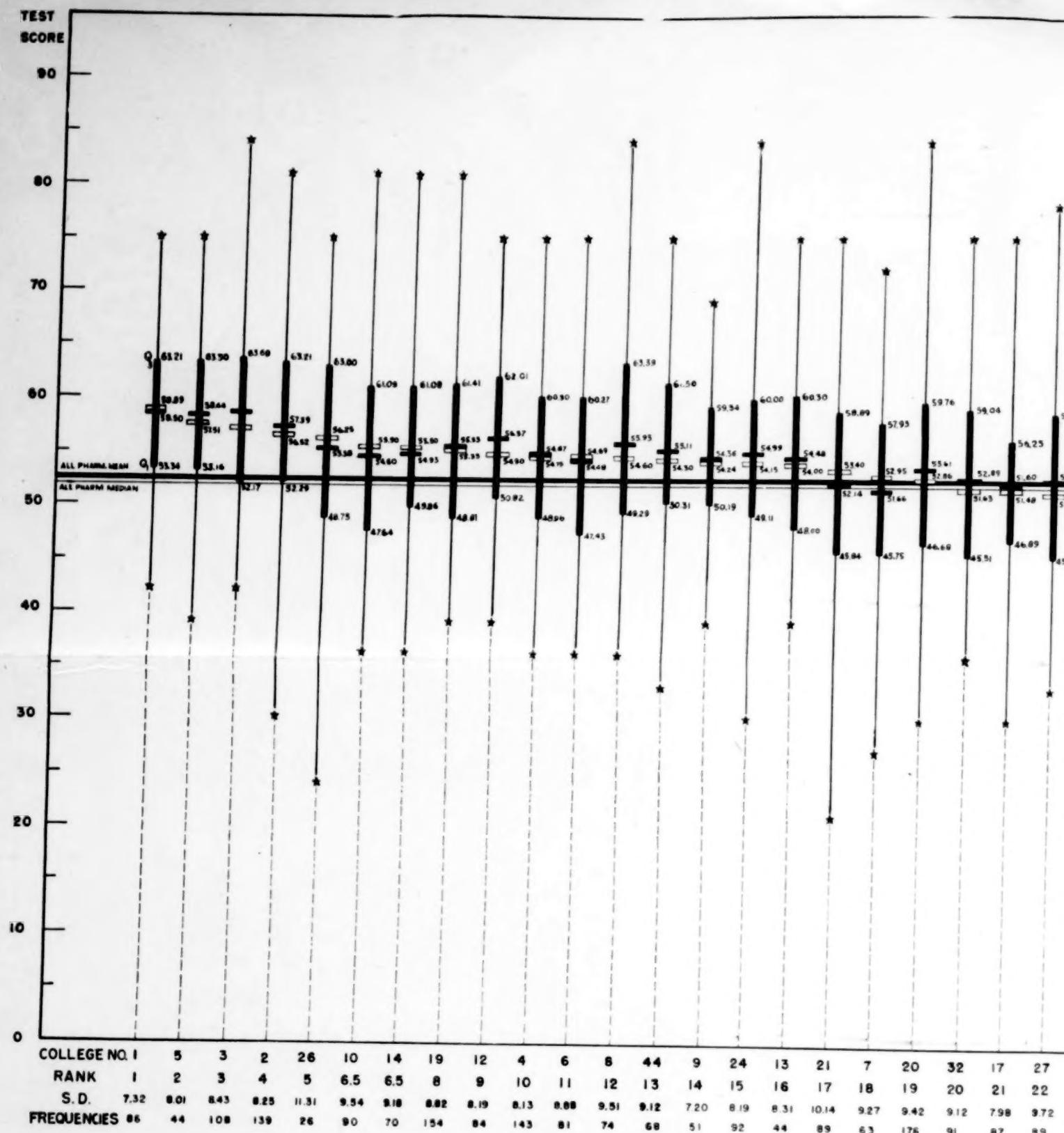
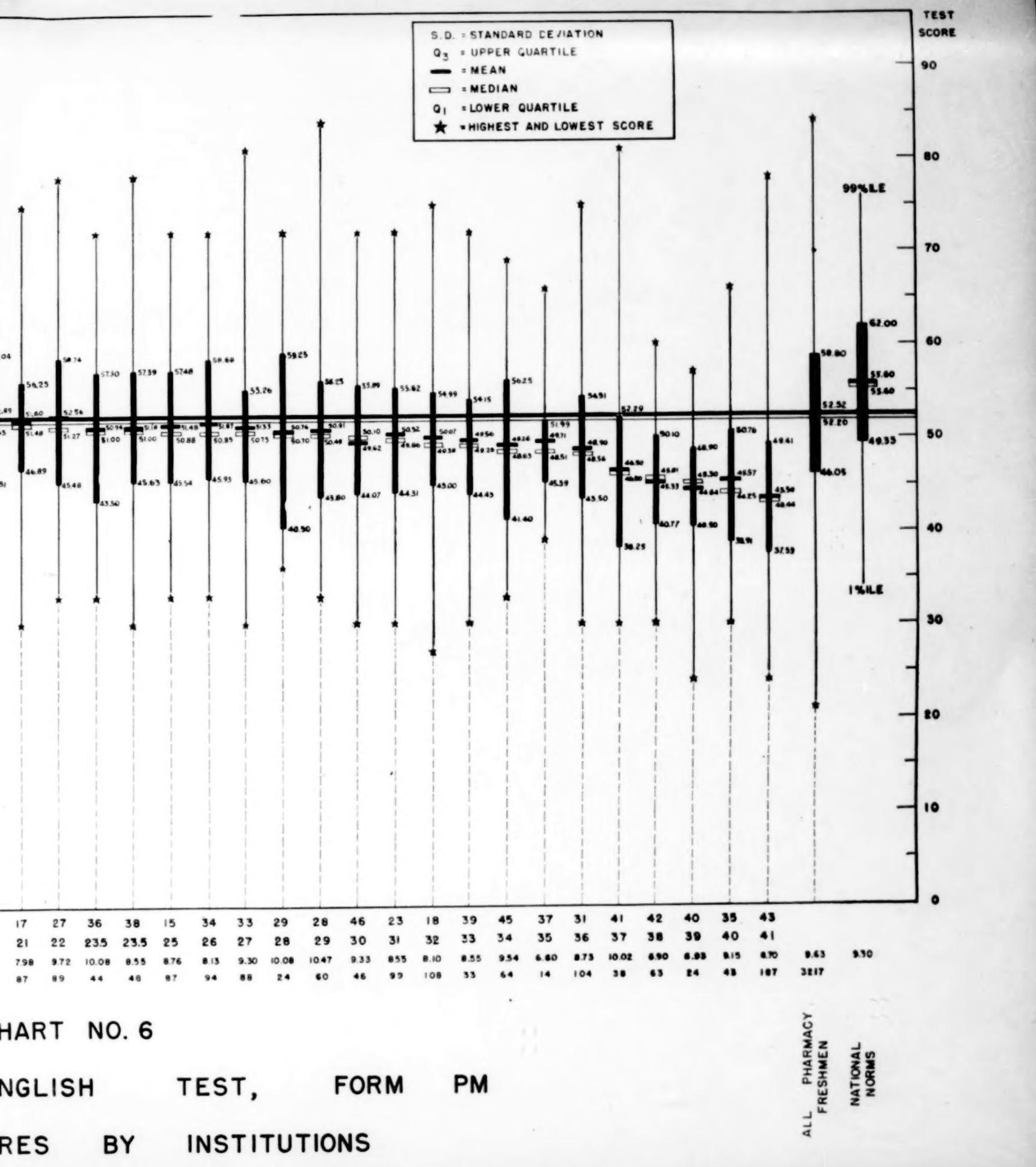
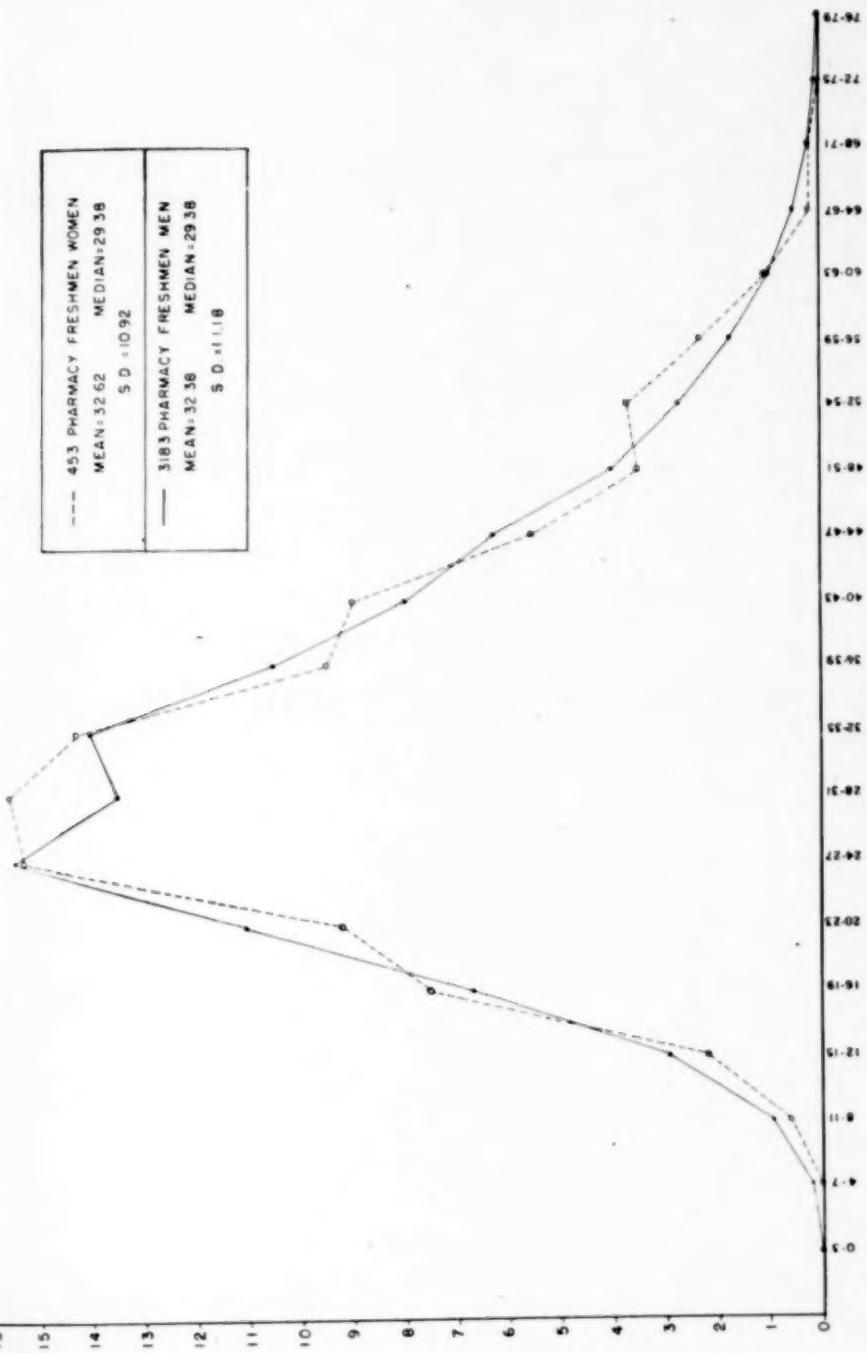
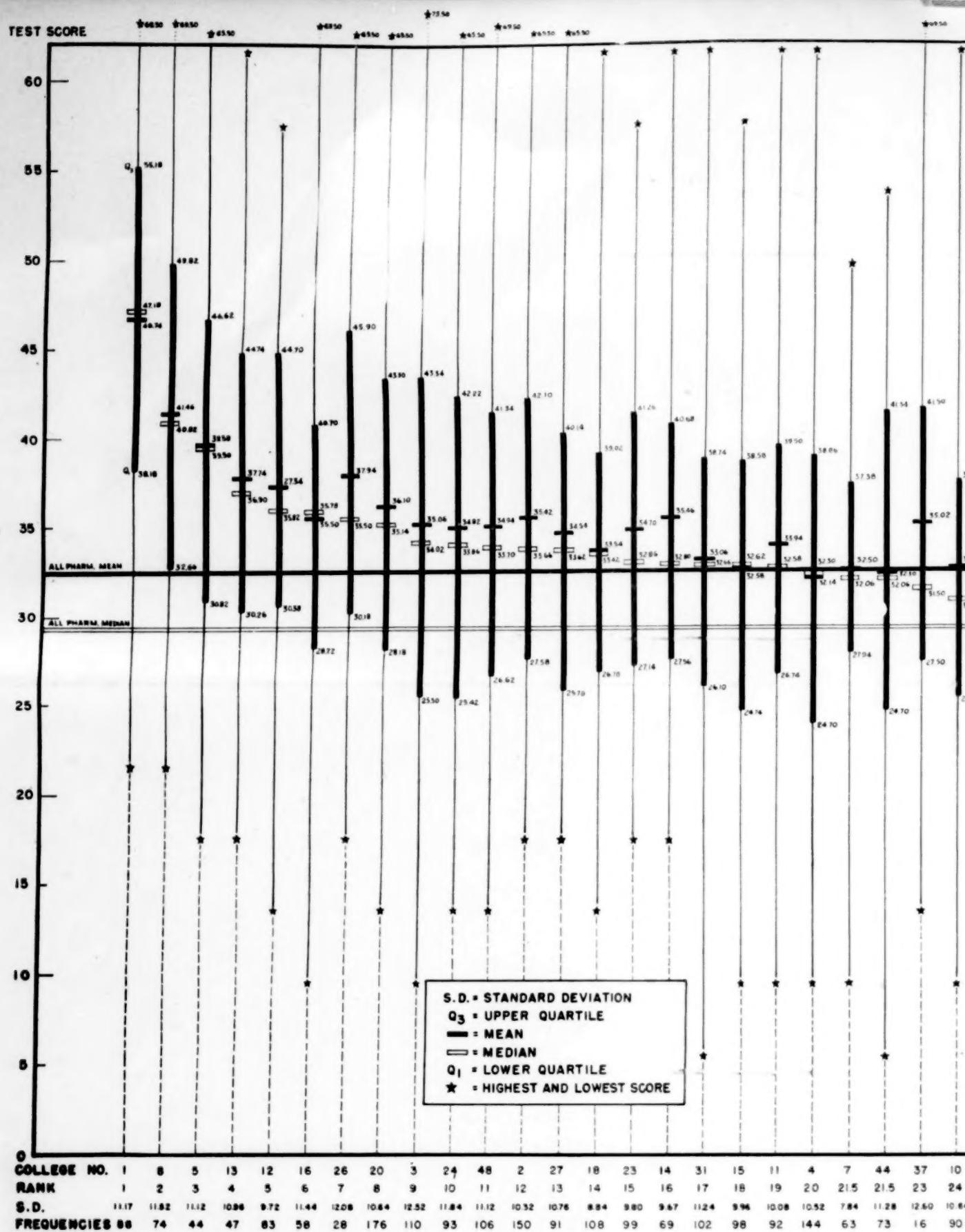


CHART
COOPERATIVE ENGLISH
TOTAL SCORES



PURDUE MATHEMATICS TRAINING TEST, FORM XM
CHART NO. 7

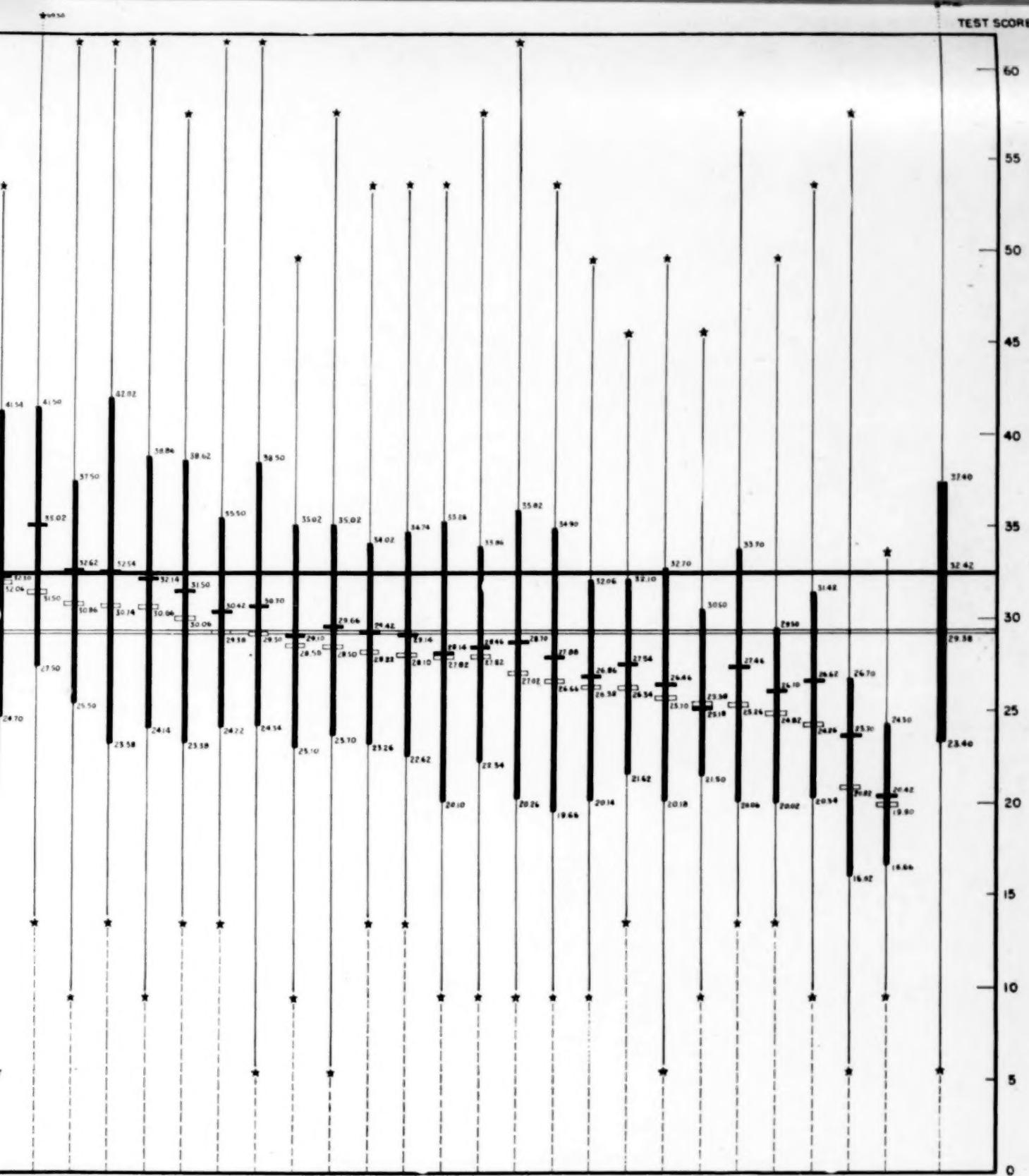




S.D. = STANDARD DEVIATION
Q₃ = UPPER QUARTILE
MEAN
MEDIAN
Q₁ = LOWER QUARTILE
★ = HIGHEST AND LOWEST SCORE

CHART N

PURDUE MATHEMATICS TR
TOTAL SCORES BY

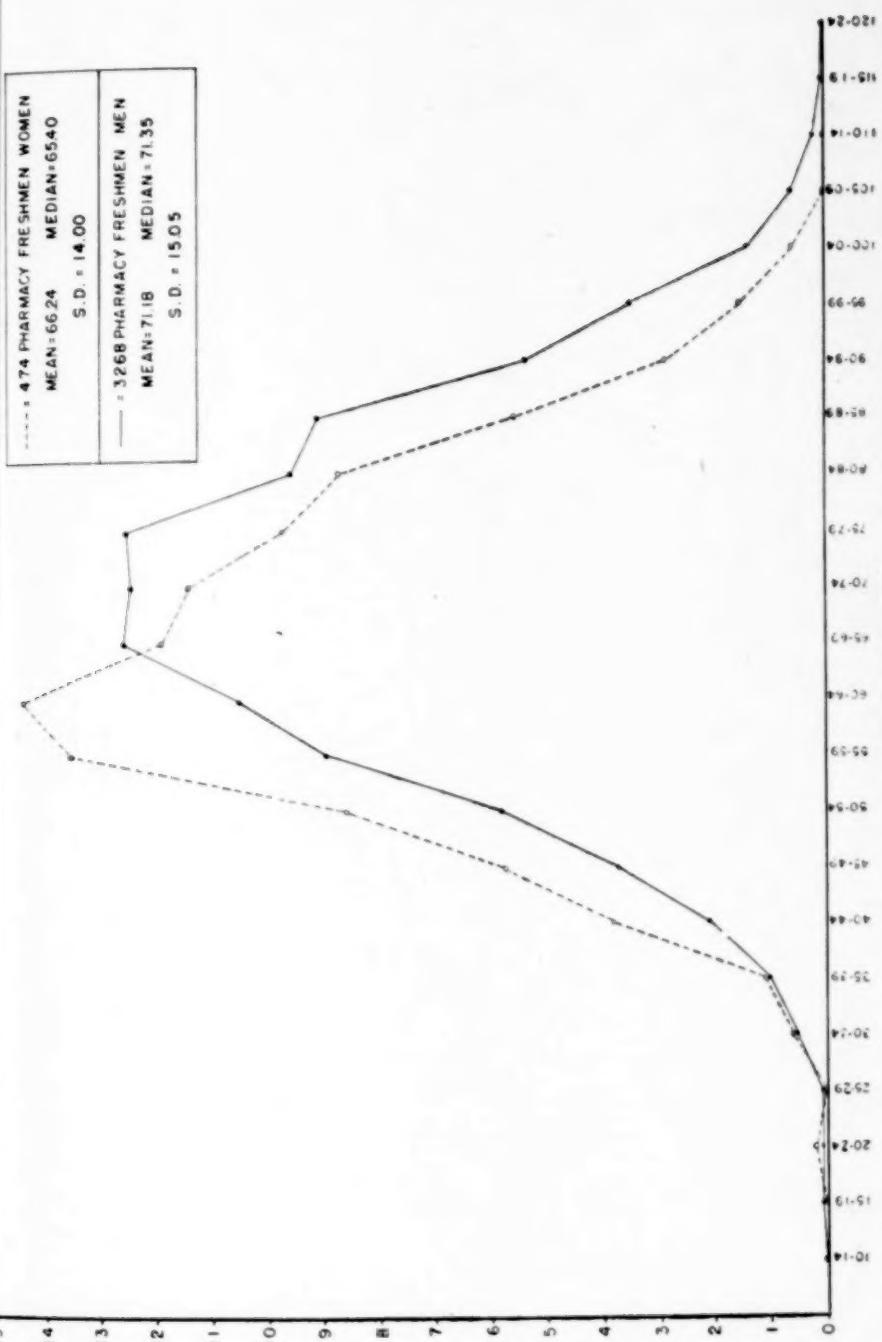


ART NO. 8

CS TRAINING TEST, FORM XM
ES BY INSTITUTIONS

ALL PHARMACY
FRESHMEN

PURDUE PHYSICAL SCIENCE TEST , FORM AM
CHART NO. 9



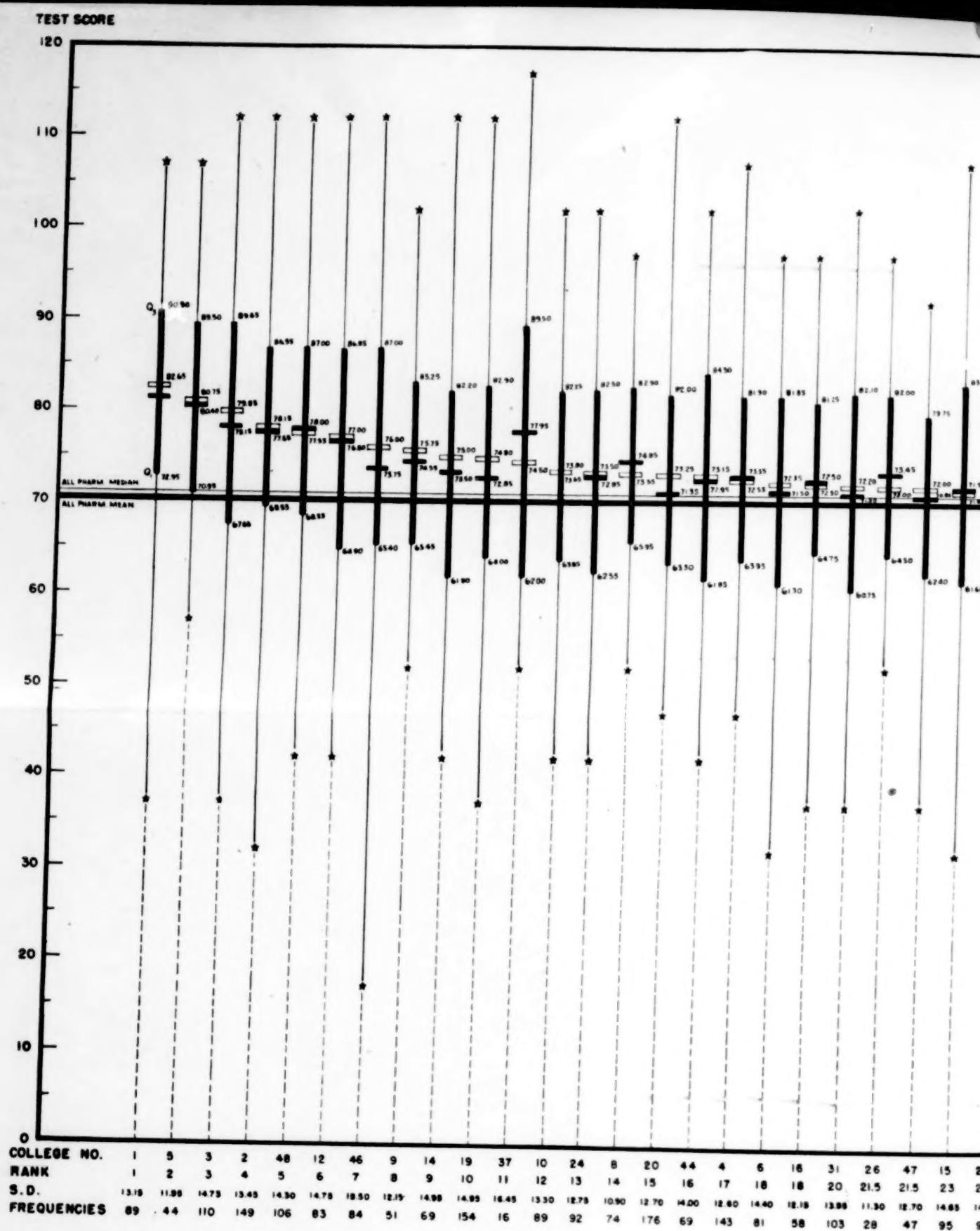
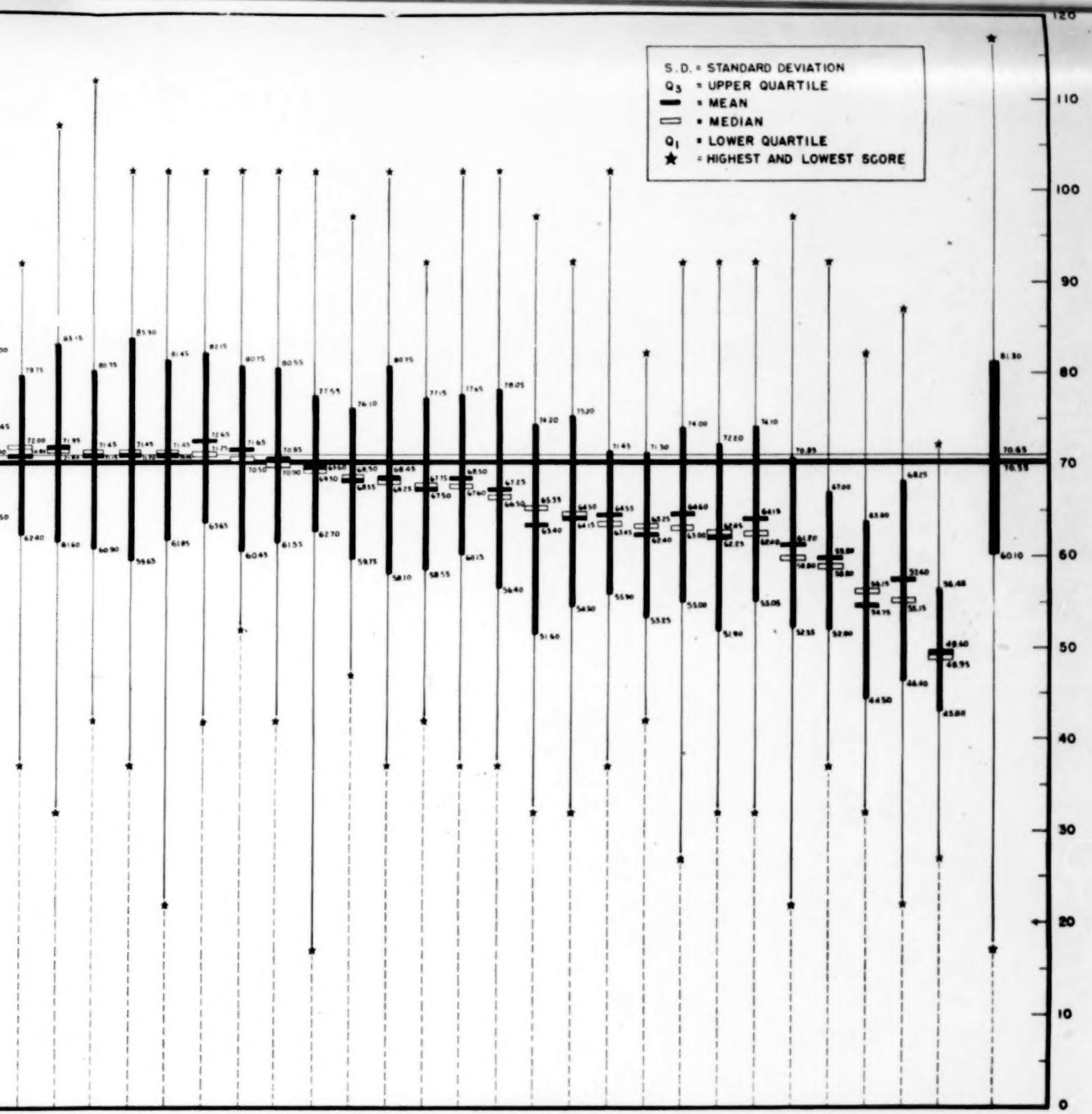


CHART N
PURDUE PHYSICAL SCIENCES
TOTAL SCORES BY



Institution	Mean	Median	Q ₁	Q ₃	Highest Score	Lowest Score
47	21.5	23	25	25	25	25
46	23	25	25	25	25	25
45	25	25	25	25	25	25
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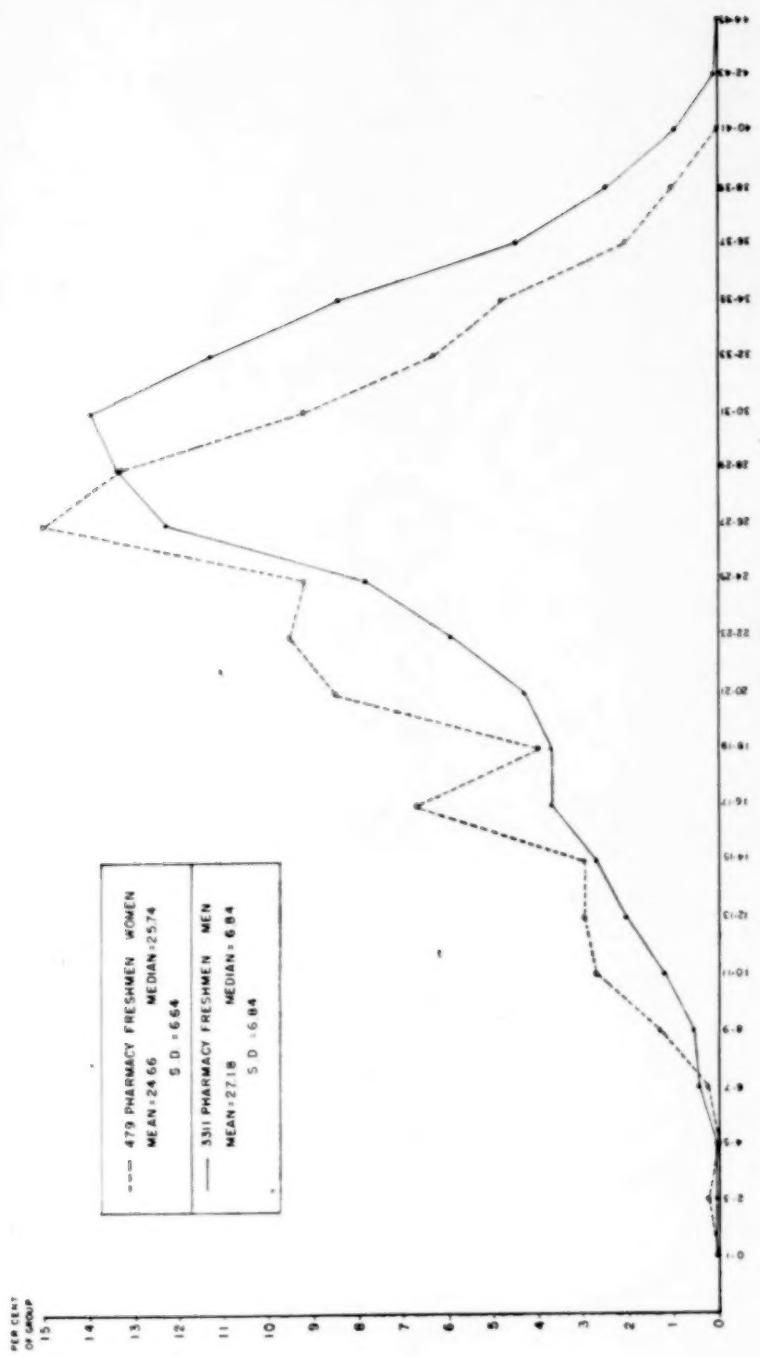
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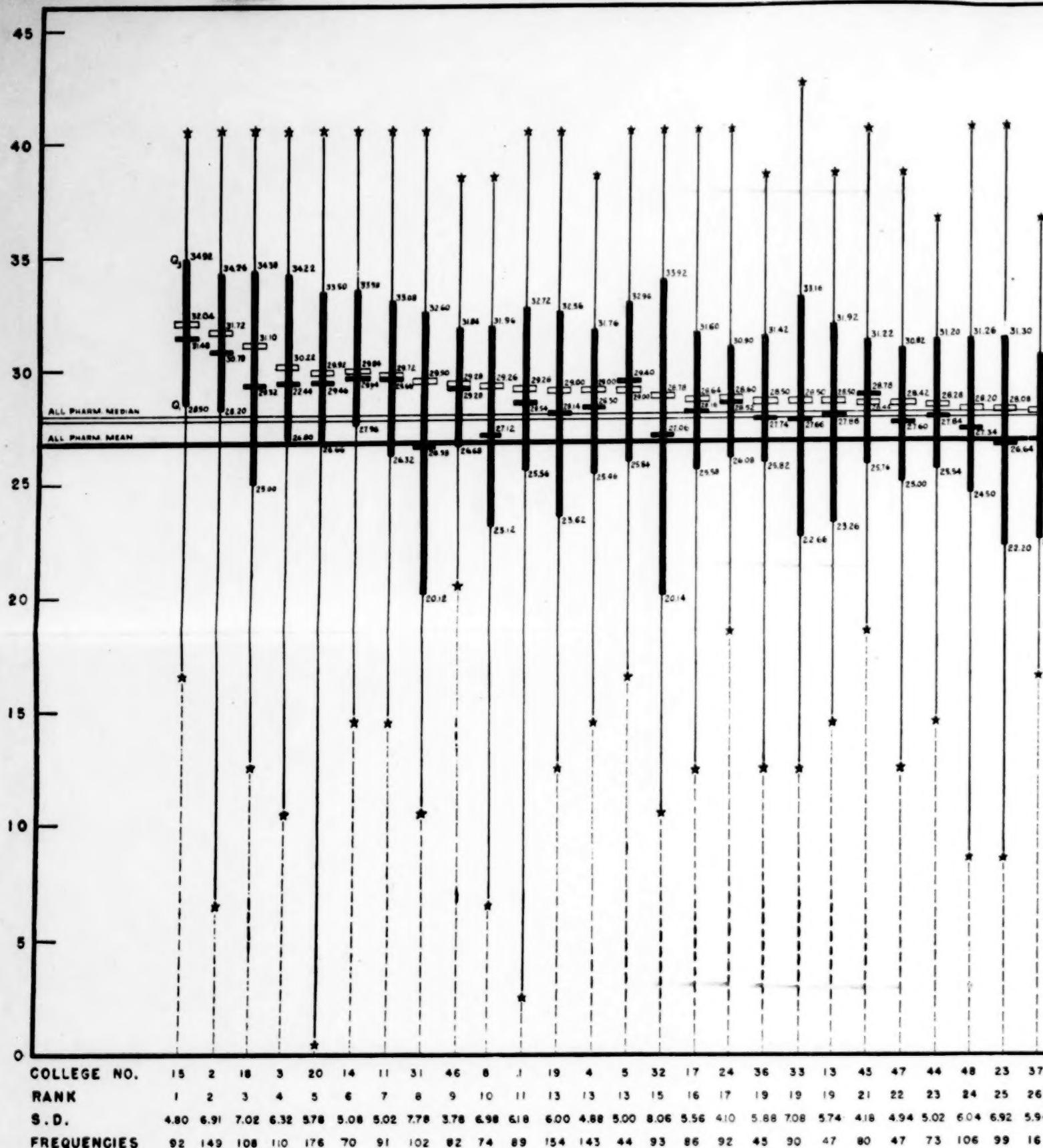
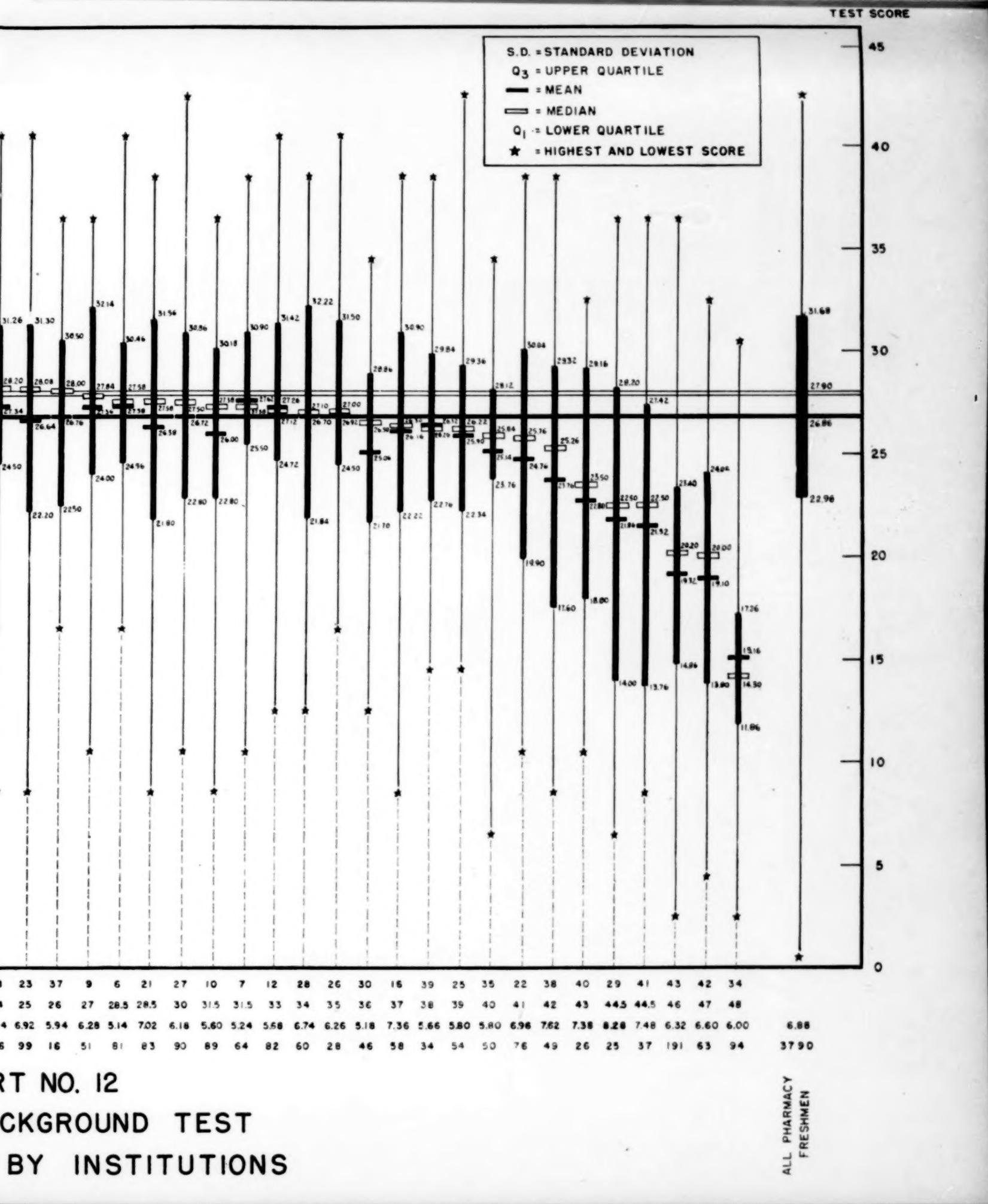


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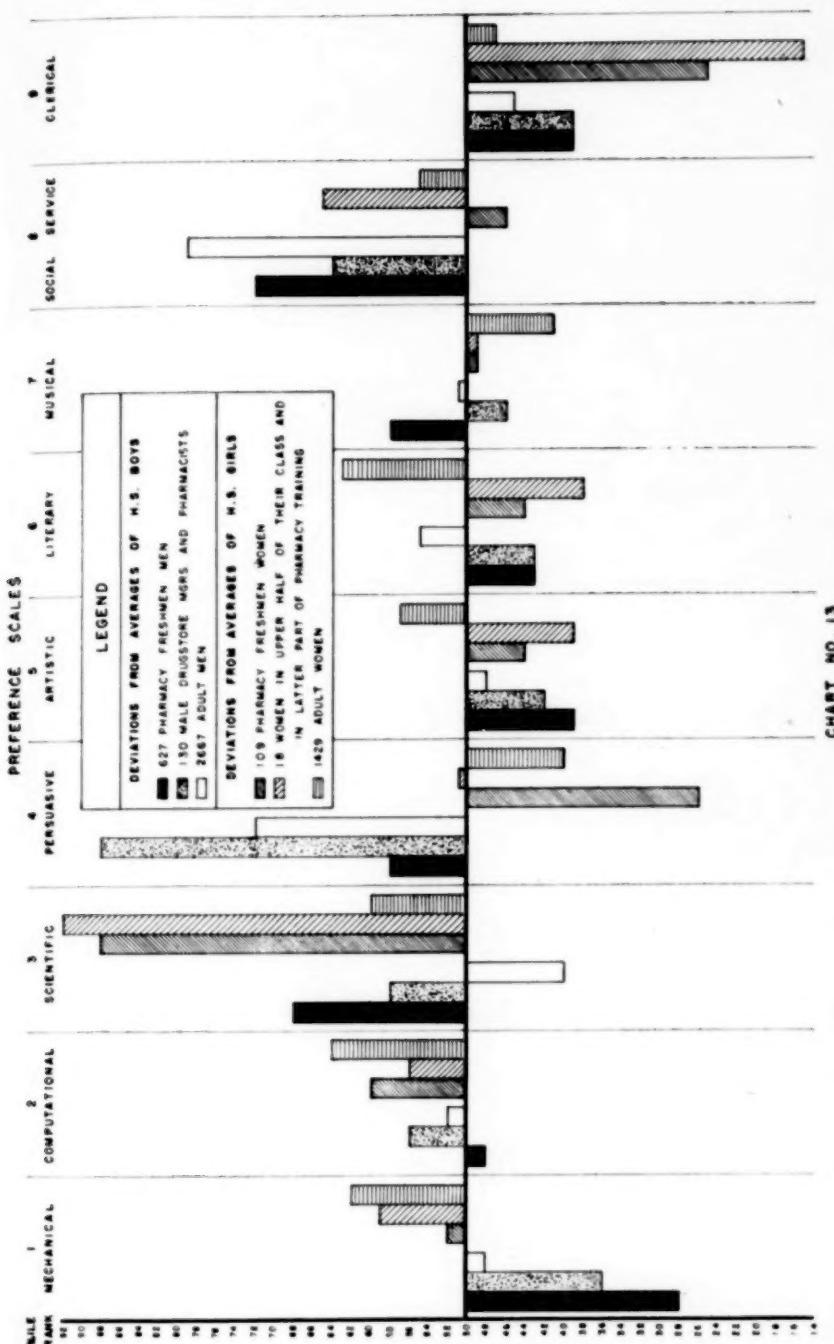
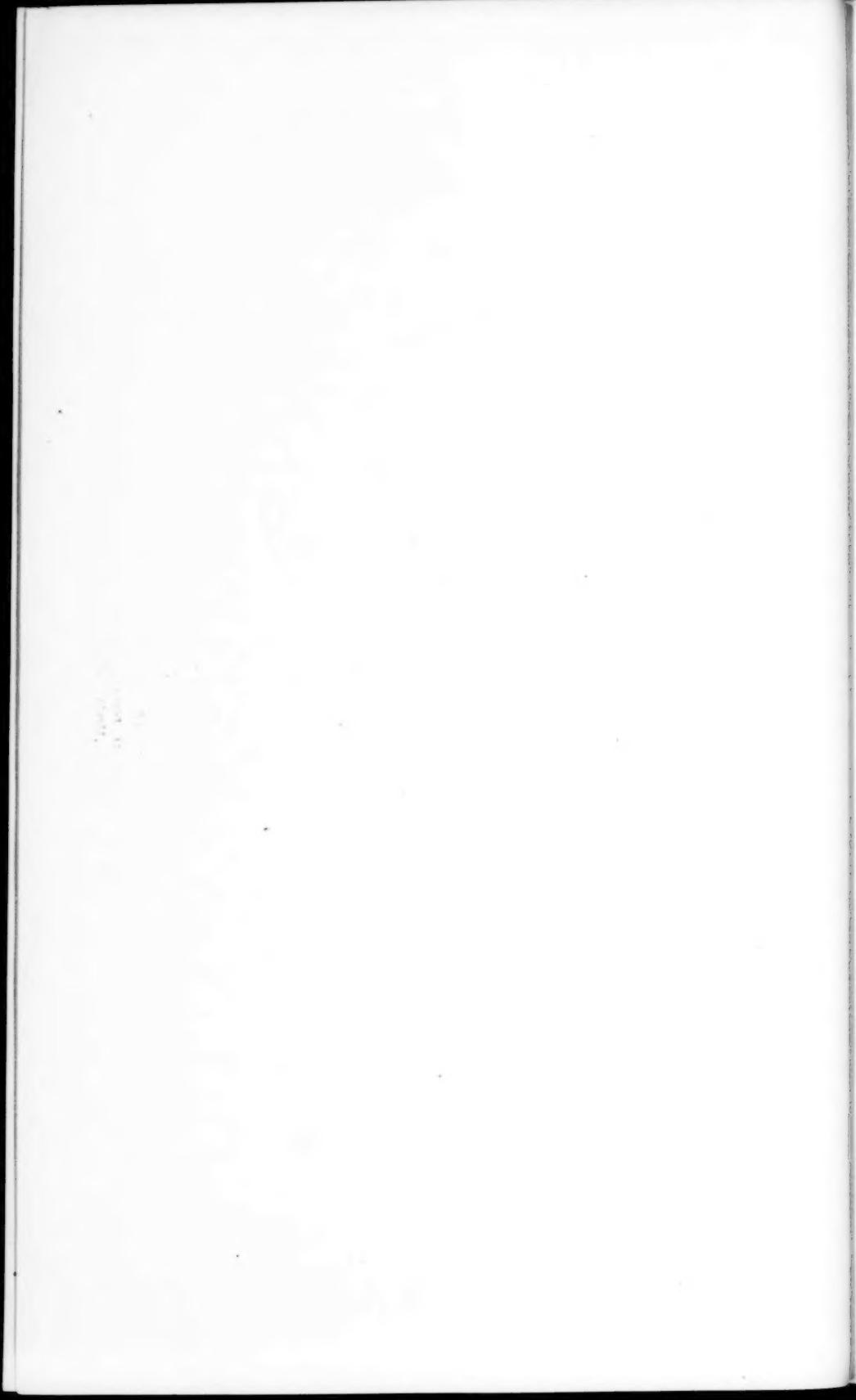


CHART NO. 13
KUDER PREFERENCE RECORD
DEVIATIONS OF AVERAGES OF PHARMACY FRESHMEN AND OTHER GROUPS FROM AVERAGES OF
HIGH SCHOOL PUPILS OF THE SAME SEX



A Remington Medal Address (1947)*

RUFUS A. LYMAN

The Universities of Arizona and Nebraska

It was still the era of the pioneer. Spring had come in the country of the Great Plains. The winds of March had spent their force. The April showers had refreshed the sod. The warm May sunshine had caused the Nebraska prairies to be clothed as far as the eye could see, with a mantle of green. Upon the crest of a hill overlooking a valley stood the Bunker Hill School house, one of those one room institutions of poetic fame. On the afternoon of the day of which I write a contest was to be staged for a Demorest Silver Medal. Seven small boys had been induced to compete. I was No. 7. The objective of all speeches was to dethrone King Alcohol. In my speech the King was personified as a serpent and his destruction had dramatic possibilities. I got some ideas from an evangelist at a Methodist camp meeting. I saw him kill sin, personified as the devil. And the Presbyterian minister in the church of my boyhood had some gestures which seemed to me both graceful and effective. I drew heavily on these sources in the preparation of the handling of that snake, only I went the evangelist one better by sinking some tacks into the heel of my boot. When I got those nails astride of that snake's head I performed a whirling deverish act and ground the snake's head into the floor. And as he lay there squirming in the agony of death I assumed the pose of a Roman gladiator after he had broad sworded his victim and placed his heel upon his victim's neck. The applause of my school mates was deafening, and as I took my seat I could all but feel that shining medal against my chest. I was all the more confident because a great uncle of mine was one of the judges. But it was *not* to be. When the judges' report came in, not the medal but place No. 7 was mine. As I passed my great uncle he glared at me and

*Read at the Remington Medal Award dinner, Hotel Pennsylvania, New York, December 3, 1947.

said, "Just see how you marred the platform. I am going to tell your father, and if he don't give you a sound trouncing I know who will." The disappointment and humiliation of that hour was crushing. On that day medals passed out of my life, but my zeal to kill the serpent increased as the years rolled by.

More than three score years had passed. Again it was the month of May. I opened a letter and certain words stood out on the page. They seemed to jump at me. "*Lyman—Remington—1947—Hugo Schaefer*". I read it again, and then again. I thought of the snake of the olden day. I said it cannot be. The next day came a telegram from Dr. R. L. Swain. Then from H. Evert Kendig. Then I knew it must be so. Presbyterians are too Scotch to pay for telegrams that have no meaning. Then came letters from every corner of the nation —by the tens and hundreds, all telling me it was so. All summer long they came, and they are still coming. But none of them tell me why.

"I like Arizona. I like its people. I agree with Westbrook Pegler who says when he retires he "wants to go to Arizona and get a sports job on the Tucson Citizen or the Republic at Phoenix or the Brewery Gulch Gazette down in Bisbee, in a real country league, the Arizona-Texas, where they play the kind of ball the Yankees *used* to play and where they remember that to err is human, and never try to pretend *they ain't*." Arizonians do not claim to be anything they are not. I like that kind of people and I want to be that kind. I appreciated being awarded the Remington Medal, but I hesitated at accepting it because of my unworthiness. I had a similar experience on another occasion, many years ago, when I was ordained an Elder in the Presbyterian Church, when I knew, and God knew too, of my unworthiness.

In the due course of time the June 23rd issue of Drug Topics came. I turned to "Your Pharmacy and Mine" as I always do for a bit of inspiration or instruction, or both. What should stare at me from the page but—"Lyman, Rem-

ington Medalist". I read the editorial and with fatherly pride I passed it to my younger son. He read it, much to my disappointment, without any sign of emotion. After a moment he said, "I thought you said Dr. Swain was the smartest man in American pharmacy." I acknowledged having so spoken. He said, "Well, I don't think so." Then after a thoughtful moment had elapsed, I said "I'll take it back, but I can truthfully say he is the most generous Presbyterian I have ever known." And to that the son assented.

Then I scanned the list of Remington Medalists—twenty-four in all, from James H. Beal to Joseph Rosin. I knew them everyone. I matched my accomplishments with theirs—and always to their advantage. The name of the beloved Eugene G. Eberle reminded me of an incident that occurred soon after the great Remington had passed. Dr. Eberle said to me—"Remington's accomplishments in the field of pharmacy were many, but his outstanding characteristic was his ability to bring opposing forces together and direct them toward the common good." I realized the truth of that statement as I recalled the many occasions in our meetings when progress was blocked and adjournment seemed inevitable, and in a few cases secession even was suggested, that Remington rose to his feet, said a few words; the atmosphere cleared and cooperation was effected. At producing cooperation, Remington was a master.

The last day of June had come. I drew from a stack of letters one addressed in a familiar hand—it read—"Dear Lyman:—The news certainly makes me happy (the reference is to Dr. Swain's editorial). For once I agree with Swain.. Congratulations. Affectionately,—Rudd". It took Rudd to tell me why I was a Remington Medalist. In one respect I had measured up to the great master himself. The most comforting thing that has come to me in more than forty years of endeavor is the unanimity of opinion that has been infiltrating our ranks through the years, which has at last, enabled pharmacy to present an undivided front in the effort to obtain its objectives as a profession of service.

The Milwaukee meetings were at hand. I had got no farther than the lobby of the Hotel Schroeder when I was confronted face to face with Hugo Schaefer, and with a directness that is commendable in a treasurer of the American Pharmaceutical Association he got right down to business. He said the matter of program for the Remington dinner must be settled at once, and that means *right* now. Then he continued—"There will be several speakers who are well qualified to tell of your efforts, and then you will make a speech in which you will deny all the previous speakers have said". He made some suggestions as to who these speakers might be. I insisted as my right that Andrew DuMez come last because when he got through there would be less for me to deny. This is because Dean DuMez has become cold-blooded by years of experience in evaluating men and schools of pharmacy, although in reality he has the tenderness of a mother cuddling her first baby. But Dean Schaefer was not through with giving instructions about my conduct at this dinner. He continued—"Furthermore, you should remember that this is your Swan Song. When you are through with this you are through. Then you will be on a basis comparable with the ex-presidents of the American Pharmaceutical Association, but without portfolio and without vote. You should remember also that you will not be talking to a group of school teachers alone, but in the audience there will be men of wealth, men who have made their wealth in pharmaceutical industry and collectively they represent an investment of", and I'll not repeat the figure he used because I cannot comprehend its vastness. The figure was a monstrosity like many other monstrosities to which the New Deal gave birth.

I asked Dr. Swain what I should say to this group of men because he has become acclimated by hobnobbing with men on that level. He looked away off in the distance and said, "It doesn't make any difference what you say just so it is *all Lyman*". And then he left me to ponder over the meaning of that. Bob Hardt was helpful. He said, "If you want to win the everlasting gratitude of this group of men say just

as little as you can, in just as few words as you can, and in just as short a time as is possible." Joe Nöh dodged the real question, but he reminded me that I would be expected to appear in a dinner jacket, but if my hair was not Western, Nebraskans of the yesteryears would disown me. Rudd was not there, but I know what he would have said had he so been—It would have sounded like this—"Lyman, if you can't say something that would display a higher degree of intelligence than you have ever shown before you will render pharmacy a real service by simply making a bow and saying nothing." Through many years of colleagueship and comradeship I have learned to respect Rudd's judgment.

Bearing in mind the admonitions of these friends of mine, I now approach my subject.

It is difficult for one who has been engaged in pharmaceutical activities for four decades to bring anything new or challenging to his colleagues or to the practicing pharmacist or even the pharmaceutical industrialist, for our associations have been sufficiently close so that we all have a pretty clear understanding what the problems are. Some time ago I was asked to write an article which would convey to the retail druggists some "sound, hard hitting ideas for the betterment of pharmacy". That request struck a responsive cord in me, for through an active life of forty years I had been seeking such ideas, not to pass on to the pharmacist but for my own guidance, in order that I might carry out the task to which I had been assigned. So far as the retail druggist is concerned I had long ago discovered the thoughtful one was quite as much concerned about the betterment of his profession as a practitioner as I was as a so-called educator.

I do think it is worthwhile, however well we are familiar with pharmaceutical developments and attainments since the turn of the century, to pause for a few moments and retravel the road and see where we were at the turn of the century, how far we have come, where we are now, and what the

prospects of the future are. Out of that we may find some guide posts for future conduct and, what is even more important, some inspiration for attacking the tasks that lie ahead.

Ordinarily I do not go back of the days when pharmaceutical education became my personal problem. That was the year 1908. It was the era of Remington and Caspari, of Edward Kremers, Henry Kraemer and James H. Beal, of Rusby and Searby and Hynson, of Hallberg and Oldberg, and Schneider, of Sayre and Stevens, and Army, of Bradley and Scoville and Whelpley and Eberle and Wulling, and a host of others who have passed on. I think of them as Giants in the Earth in those days.

But I *shall* go back of that era for a moment to mention an event, which to me, is the most significant one in the whole history of American Pharmacy, namely—the establishing of pharmaceutical instruction upon the campus of the University of Michigan. That occurred in 1867, just eighty years ago. The man who was responsible for it was not a pharmacist. Albert B. Prescott was a physician and a chemist. This act brought to pharmaceutical education the moral and financial support of a great state supported institution and precipitated pharmacy into our system of state education. Not only did it do that, but it gave pharmaceutical education a stability it could not have acquired except by becoming a part of the educational system of the state and the responsibility of the taxpayer, and created a public consciousness of the importance of educating pharmacists. The significance of this act becomes all the more impressive when we recall that long before Charles W. Eliot retired from the presidency of Harvard University he was asked to name the ten men who he considered had influenced most the thought of the world in the last two hundred years. In that list only two Americans were included. One was Ralph W. Emerson; the other was Horace Mann—a country lawyer who moved to Boston and in the course of time became secretary of the Board of Education and in that position formulated a plan of education which became the foundation of America's

educational system, the greatest system for universal education that the world has ever known. Prescott introduced pharmacy into that system.

We can rest assured that pharmaceutical instruction was undertaken by the University of Michigan not without opposition. It did meet with opposition, and that opposition came very largely from pharmacists themselves. The sentiment of the times is indicated by an action in 1871 at the St. Louis meeting of the American Pharmaceutical Association, and by the Association, when the (School of Pharmacy of the) University of Michigan was denied the recognition of being a college of pharmacy "within the proper meaning of our (the Association's) constitution and by-laws, it being neither an organization controlled by pharmacists, nor an institution of learning which by the rules and requirements insures to its graduates the proper practical training to place them on a par with the graduates of the several colleges of pharmacy represented in this Association". Pro. Am. Pharm. Asosciation, 19; 47, 1871.

A few years ago I asked Dr. Edward Kraus of the University of Michigan whether the University undertook the task of pharmaceutical instruction out of a concern over the type of pharmaceutical instruction of that day, or was it done out of its regard of and for Albert B. Prescott. His reply was—"I am afraid it was done out of regard for Prescott". After all, the why's and how's and where's are immaterial. It *was* done. It marked the beginning of a new era in pharmaceutical education, but out of a sense of justice credit should be given where credit is due.

It has long been an acknowledged fact that the greatest and most rapid progress in professional education has been made in those fields that first formulated and then most assiduously improved the educational program. Medical men were quick to grasp the truth of this fact and apply the principle to their own field, and that is why medicine today occupies an enviable position in the professional sphere and in the

minds of the public as well. Medical men have pretty well set the pattern for progress in the field of the health sciences.

Another epoch-making event in the history of pharmaceutical education took place in Richmond, Virginia in 1900, by the creation of the American Conferences of Pharmaceutical Faculties which later, without any change in its organization or its objectives, became the American Association of Colleges of Pharmacy. The objective of the Association was to improve pharmaceutical education and research. Albert B. Prescott was its first president, Joseph P. Remington its second, and Edward Kremers its third, and through its forty-seven years of existence its activities have been directed by the most constructive minds in American pharmacy. It is hardly necessary for me to say that this organization has been a potent factor in formulating the present educational program and has been a leading factor in promoting the legislation which has determined the standards for pharmaceutical practice.

It is not necessary to go into the details of this program or the results it has accomplished, but I do want to sketch a brief picture of the changes that have taken place within the realm of my own personal experience and observation.

In my time I have seen the requirements for the study of pharmacy increased from 1 year of high school (in some states the 8th grade) to four. I have seen the minimal college requirement increased from two years to four. I have seen the requirements for the practice of pharmacy increased from no academic requirements to the present four year requirement including the bachelor's degree, and today there is sweeping through our nation the recognition of the necessity of going to prepharmacy training as well as the developing of graduate instruction. I have seen pharmacy emerge from an *obscure*, and in many instances a *degraded*, position on our university campuses to an equality with other professional schools. I have seen the scholastic attainments of pharmacy students measure up to those of other professional

groups. I have seen the time come when as large a proportion of pharmacy students are given recognition by the honorary scientific society of Sigma Xi as in other disciplines. I have seen pharmacy establish an honorary scientific society of its own. I have seen pharmacy emerge from being a nonentity in national scientific and educational work to become active in the work of such organizations as the American Association for the Advancement of Science and the American Council on Education. I have seen pharmacy establish the American Journal of Pharmaceutical Education, the only journal in the world dealing exclusively with the problems of pharmaceutical education. I have seen pharmacy become a factor to be reckoned with in various governmental agencies. I have seen it become a unit in the Medical Administrative Corps of the Army and of the Navy. I have seen it create its own standardizing agency. I have seen it do for itself what some of the great foundations did for the other professions. I have seen the Commonwealth Fund spend \$64,000 to make a functional study of the pharmacist to determine the value of his service and improve the educational program, and I have seen the American Foundation for Pharmaceutical Education created to foster pharmaceutical education and research, and in these latter days I am seeing the Foundation back a nationwide survey of pharmacy costing that organization around \$170,000 and conducted under the auspices of the American Council on Education and directed by the most experienced and brilliant minds in the educational and professional fields for the express purpose of discovering the needs of pharmaceutical education and practice in order that pharmacy may better fulfill its mission. I have seen the American Institute of the History of Pharmacy become a reality, and because of that I have seen the first chair of the History of Pharmacy ever to be established in a great American university, or for that matter, in the world, namely, at the University of Wisconsin. And most satisfying of all, and as a result of it all, is the increase of morale and the regard which the retail pharmacist has for the dignity of his own service and the increase in respect for his own profession.

This is but a brief resume of the progress that pharmacy has made since the century's turn. There is no more amazing, yet unheralded, accomplishment in the history of professional education than the progress pharmaceutical education has made in the twentieth century. As we face the middle of the century with such a record of accomplishment well may we ask what are the problems that are in store for us ahead, and well may we think briefly about them one with another.

One thing is certain. For a profession to become static in its educational program is to go backward. If we wish to commit professional suicide that is the course to take.

For many years the American Association of Colleges of Pharmacy has had a standing committee, known as the Committee on Problems and Plans. The Association defined its functions as follows.—"It shall be the duty of this committee to define problems that pertain to pharmaceutical education and the welfare of the Association and to institute a study of such problems and suggest plans of attack upon them". This committee's membership is composed of thirty of our highly educated young men who have demonstrated their ability to do constructive thinking and have a willingness to do constructive committee work. One of the major problems that the committee has given its attention to for the past two years was a product of our war experience. We

were asked to study the problem as to what should be done to make pharmacy qualify for more effective service in the health field. Even before the days of the war Mr. Walter F. Meads, Secretary of the Board of Pharmacy examiners of the state of Iowa, had made the general statement that, "The pharmacist should get this point fixed firmly in his mind: that it will never be possible to promote successfully any legislation in the interest of the profession of pharmacy that is not backed by the sound policy of public health and welfare."

As a result of the committee's study there came the following conclusions, unanimously:

1. In the future, as in the past, the usefulness of the profession of pharmacy in the health field will be determined by the character of its educational program.
2. In strengthening the educational program the first step is to place greater emphasis upon the basic sciences.
3. The undergraduate program should be revamped so as to make undergraduate instruction more effective.
4. We should confine our educational activities to things pharmaceutical.
5. Foster research in the pharmaceutical sciences, having in mind the production of inspiring teachers and research workers, which will also be conducive to the production of high grade pharmaceutical literature, including textbooks, in greater abundance.
6. Finally, the declaration of a long range program from the prepharmacy to and through the graduate level that will place pharmacy upon a sound educational basis comparable to that of the other health professions.

If these conclusions of the committee are sound, and I believe they are, the problem that confronts us is how are these suggestions to be implemented and our objectives attained.

And that brings us to consider briefly the Pharmaceutical Syllabus which has been our guiding instrument through almost half a century of endeavor. Without intending to do so, and without any desire to do so, we made a monstrosity out of the Pharmaceutical Syllabus—one almost worthy of the New Deal.

There is a railroad out in my country that is famous for making a schedule that it cannot maintain. They can't cover the distance in the time allotted. That's exactly what we did to the Syllabus. I had my finger in it almost from the beginning, and I am as guilty as anyone for what was done. Nevertheless, the Syllabus served a useful purpose. It was a sin-

cere attempt to organize the pharmaceutical curriculum and bring order out of chaos, and it did. And further it made possible for the boards of pharmacy to organize state board examinations and make them more uniform, which in turn made possible the reciprocity arrangements so much to be desired. But we didn't have wisdom enough to know when to stop rolling the snowball, and so the Syllabus content grew and grew until it outgrew its usefulness and, as Dean Ernest Little has often said, it left no room even for experimentation—and when we reached that point curriculum building became static. When the American Council on Pharmaceutical Education abandoned the Syllabus as a measuring rod for the accreditation of colleges the organizations that had sponsored it through the years gave the act approval. Nevertheless, the Syllabus represented the best thought of American pharmacists through four decades, and should be and will be used as a basis in this era of reconstruction of the curriculum which we are now approaching. And in doing so it will be well to bear in mind the words of wisdom of the late beloved Dr. Lotus D. Coffman, president of the University of Minnesota. Speaking before the American Council on Education in the Hotel Mayflower in Washington a few years ago he plead for educators, both general and professional, to hold to the *basic* principles of education that have been *tried* through the years. He also plead for *change*, but *not* without applying the principles of scientific experimentation which would prove the value of such changes. And then in words which still thrill my very being, he said—"I agree fully with the English Association for Education in Citizenship which declares that 'If democracy is to survive and develop as a living force, our educational system must produce men and women loving freedom, desiring to serve their community, and equipped with the necessary knowledge and possessing powers of *clear* thinking to enable them to become effective citizens.' It is because I believe in necessary knowledge that I make a special plea for education that puts lime into the bone, iron into the blood, and organized knowledge into the minds of the youth of this generation." Dr. Coffman made no claim to being a scientist. He was an educator.

But he believed in applying the methods and principles of science to the problems of education on all of its levels in all types. In the case of pharmacy, the Pharmaceutical Syllabus represents the principles of education that have been tried through the years. Our problem is to modify it or reconstruct it, using the scientific method in doing so.

The first step we must take is to quit trying to *fool* ourselves and the other professions and the public into thinking we have a four year professional pharmaceutical curriculum. We have *not*—and you can't make it one by constant repetition of the falsehood any more than Couie could cure cancer by repeating the formula, "Every day, in every way, I am feeling better and better". We didn't fool the War Manpower Commission in the last war, and if we wish to fare any better in the next one we better correct this condition before the shooting begins.

If the first step is to stress the basic sciences, let's take general physics, the general chemistries, and the general biological sciences out of the 4 year curriculum and give them prepharmacy status where they belong. The College of Liberal Arts can do a better job at stressing them than we can. That is their specialty. English does not belong in the professional curriculum. One should be able to speak and write well before he reaches the professional years. Neither does 8th grade arithmetic. And we don't fool the College of Liberal Arts either by giving it a more euphonious name like pharmaceutical mathematics or pharmaceutical calculations. Changing the name of an 8th grade subject doesn't elevate it to the college level any more than calling a *horse* a *mule* makes him a *hybrid*. We must quit doing those things that make us ridiculous in the eyes of educated men and women. Furthermore, we don't make our professional curriculum any more professional by introducing into it college algebra or trigonometry or the calculus. They again are basic sciences and belong in the prepharmacy level. When all these basic courses are placed where they belong, then and not until then, are we in a position to build the *professional pharmaceutical*

curriculum in such a way so that it will prepare the student for the practice of pharmacy and lay the foundation for specialized work on the graduate level. As the course now stands, there is not one student in a hundred who completes it who is qualified to pursue graduate work in any highly specialized field without taking a year or two in basic and broadening courses to prepare him for his work. Until we correct this condition, pharmaceutical industry will have to continue to seek men for the research and control laboratories and manufacturing plants from men who have a more comprehensive training in physics, chemistry, and the biological sciences--although any manufacturer will admit that if pharmacists had had more basic training in those subjects, their pharmaceutical training would be a tremendous asset in industry.

I shall mention only in passing that oft-repeated warning of the distinguished secretary and creator of the American Council on Pharmaceutical Education, Andrew G. DuMez, that we would make the greatest gain by confining our activities to things pharmaceutical and not attempting to make our pharmacy colleges preparatory schools to medicine, dentistry, business or engineering. I would *not have been surprised* if some pharmacy school had established a preparatory course for entrance to Princeton Seminary. *It might be more to the point to ask Princeton Seminary to bring some ethics to our pharmacy schools.* When we stop to think it over, how foolish it seems for us to attempt to scatter our energies when we have so much to accomplish in our own field of endeavor and so little in the way of equipment and men to do it with. I have never known any one to approve of this type of wastefulness except deans. Deans are a peculiar variety of the human species--They are not understandable. They are incomprehensible. The things they should do, they do not do; and the things they should not do, they do--and as a member of the craft I myself have done that very thing. That is why, many years ago, when I recognized this weakness in deans, I created the slogan--"What pharmacy most

needs is the funerals of a lot of deans." The truth of that statement has not yet become obsolete.

And finally we come to the graduate level. The objective of graduate work should be to stimulate and develop the creative instinct in man. If we are to have inspiring teachers, and creative workers in all fields of pharmaceutical endeavor, suitable individuals must be discovered and their education must be one of our primary concerns. Education on the graduate level is not the function of the undergraduate college but of the graduate school. But the seeking out of those who have special talents for independent action and the inspiring of them by the warmth of a personality to work in the specific field of their choice and usually the directing of their work, fall to the lot of the instructors in the undergraduate college.

Unfortunately, on the campuses of many of our universities we find an indifference, if not an open hostility, toward graduate work in pharmacy. This is due in part to the fact that pharmacy is looked upon as an applied science. Yet in the same institutions graduate work in medicine is encouraged and well supported. This directly opposite attitude toward pharmacy and medicine is of course an untenable inconsistency, since all the health sciences are applied sciences in the commonly understood and accepted meaning of that term.

When the attention of the members of the graduate faculty is called to this inconsistency, and I speak from experience, they of course have no answer. We must credit them with basic honesty. Then they turn to the real reason, namely, graduates of the present four year course in pharmacy have not had as broad a background training as the students of medicine or those who have majored in the physical, chemical, or biological sciences; and to that *we* have *no* answer, for *we* are basically honest. This, however, is not a condition for which the graduate school is responsible. Only *we*

are responsible for this, and only we can correct this condition. It is the weakest link in the whole scheme of pharmaceutical education, and the quicker we correct it the more quickly we can take our place on a level with all other fields of professional education. After having said all this I cannot refrain from making the statement that any of us can pick out any number of individuals who have the doctorate in the major fields who are lamentably weak in their background training. Bigotry is its outstanding symptom. These are the individuals a scholarly friend of mine brands as "Ph.D. duds" or "blank cartridges". We have some of them teaching and administering in our schools of pharmacy. This, of course, is beside the point, but I feel better for having said it.

It is refreshing to know there are deans of graduate schools who have a broader conception of graduate work and the responsibility of graduate schools to professional education. One such is Dean Alpheus W. Smith of the graduate school of Ohio State University, and it is with great satisfaction that I quote from an address he gave at the 1943 meeting of that Association in Chicago. The address was published exclusively in a 1944 number of the American Journal of Pharmaceutical Education under the title, "To What Extent Should Graduate Education Become Functional as Directed to Meeting the Demands in Various (*Often New*) Occupations?"

"The responsibility of graduate schools for professional education may be illustrated by reference to medicine, dentistry, *pharmacy* and veterinary medicine. It is evident that the graduate schools have little to do with the formal training of dentists, physicians, pharmacists and veterinarians. That type of education is the responsibility of the faculties of the appropriate colleges. There remains, however, the training of teachers and research workers in medicine, dentistry, *pharmacy*, and veterinary medicine. It is one thing to organize existing knowledge and current practices. It is quite a different thing to provide leaders who will blaze new trails and create new understandings. Here the graduate schools have the same responsibilities as they have for research and education in fundamental fields like chemistry, biology and eco-

nomics. Consequently the graduate schools should maintain graduate programs in medicine, dentistry, *pharmacy* and veterinary medicine with the same interest and enthusiasm they show for other fields of scholarship, but these programs like other graduate programs should be organized about research activities. They should *not* become extensions of undergraduate programs nor prolongations of training for practitioners. They should be designed to prepare for the *creative* work which will *develop* and *recreate* the profession . . . Adhering to the principle 'that it is not the purpose of graduate schools 'to produce either learned pedants or simple artisans,' we arrive at the conclusion that they have great responsibility for the development of existing professions and creation of new ones in case these professions and occupations require the application of creative intellectual forces and form a social class of progressive guides and leaders."

That is a masterly conception of the functions and the objectives of the graduate school as related to professional education, and if it could become the universal policy of such schools the present lamentable scarcity of qualified teachers would soon be corrected.

In this connection I want to express my concern over a matter that has been a source of irritation to pharmaceutical educators for many years, namely, the apparent lack of recognition on the part of pharmaceutical industry of any responsibility to pharmaceutical education; and, furthermore, I cannot believe that pharmaceutical industry has realized what it has been doing to pharmaceutical education. I am not criticizing. I am making a statement of fact which can be documented. In my day there have been many men who died multimillionaires, having made their wealth in the pharmaceutical industry. By their wills they left millions of dollars to great universities, to medical schools, to hospitals, and for other purposes that are beneficial to human welfare; but to this date I cannot find a single instance where more than a mere pittance was left for the betterment of pharmaceutical teaching institutions, which certainly had some part in the creation of their wealth. And what adds to that irritation is the fact that industry has through the years robbed our institutions of many of our best men, cutting off their own

supply, and has done nothing to aid these institutions to continue to be the source of supply of able men. I am not a business man. I am a school teacher, but it does seem to me that this constant impoverishment of the goose that lays the golden eggs is *not* good business. I do not object to pharmaceutical industry's contributing to everything that in the end improves human welfare. In fact, I am proud of it for doing it. But not to give a just share to improve our own institutions is certainly—in the language of the labor unions—unfair. The creation of the American Foundation for Pharmaceutical Education is an indication that pharmaceutical industry is realizing its dependence upon the educative process, and in that realization there is new hope cast into the educational arena.

The greatest fear is the fear of fear. Fear was another monstrosity born of the New Deal. Fear of too little food drove us to plant more corn—raise more pigs. Before either was ready for the market the fear of too much food drove us to plow the corn under, and to massacre most of the pigs and to dump them into the river when people were still hungry. At that time Governor Bryan of Nebraska went down to Chicago, according to his own statement, to plan a course in birth control for the pigs that were permitted to survive. We still have a hangover of this use of fear in The Meatless Tuesdays and the Poultryless Thursdays. But the next day brilliant Washington declared that to be a mistake—so they opened up Thursday to the chickens, and then they saw that was a mistake and so they started the "Eat-a-Hen-a-Day-Club". Fear has been used more than any other weapon to drive Americans into regimentation and toward a totalitarian state.

Now fear has become an infectious and contagious disease. It has reached the ranks of pharmacy, so that one month we are jittery because we have too few students, and the next month we have too many. We not only have too many students, but we have too many schools of pharmacy. And so we meet in annual conclave and condemn everybody

and everything because of this situation, and we all declare something must be done to remedy the situation, and then we go home and do nothing about it. It reminds me of what Dr. Swain once said. He was neither condemning prohibition nor defending it. He simply made a statement of fact when he said prohibition went down the river because senators said one thing on the floor of the Senate, and did another thing in the coat room. Now to paraphrase that to make it fit pharmacy, we might say we have enough druggists because deans said one thing in the conclave but didn't do anything about it at the registration desk. Perhaps that is the Creator's way of maintaining a sufficient supply of pharmacists. He knows that such a thing as an ever normal granary of druggists is not possible.

Many years before the war Dean Kendig began to call our attention to a decline in the number of druggists. The war exaggerated that condition, but there were other factors, including the advance in educational requirements and the standards for pharmaceutical practice, that caused a slowing-up of production; and that was a good thing for pharmacy in general.

I have stood practically alone in this country in believing there are not too many colleges of pharmacy. I grant there is an unfortunate distribution. There are too many in some areas, and the very areas where the complaints come from are the areas where those who could and should do something about it, do nothing.

The establishment of several new schools on the backbone of the continent has been criticized, but the criticism has not come from the people who live there. Take Arizona for example. There are few people living east of the Mississippi River who know that there are only four states in the union having a territory larger than Arizona, and that all of New England could be set down within its borders. They don't know that eleven states, including the Dakotas, have a smaller population. They don't know that millions of

acre feet of water are locked up in its canyons, that in its valleys citrus fruit and date palms flourish. They don't know that its mountains are filled with copper, and silver, and gold, and other precious metals, and that cattle and sheep by the hundreds of thousands graze on the high mesas, and on the desert, and in the mountains. They don't know the grandest scenery on the continent is here and a climate that is therapeutically the envy of the world. They don't know its university has a registration of more than 5000 students, and there are other institutions in the state with a combined registration of almost that many more. And they don't know the determination of a people that insists on developing institutions of their own on a scale that will satisfy the needs of a state whose resources are still in the early adolescent stage.

It should also be remembered that a school of pharmacy has other functions than the education of students. It should be an intellectual, professional, and spiritual center for the profession within the state. It should be an institution in which they can take pride, that they can work for and cherish. As such it becomes a creator of professional morale, and an asset to the state as a public health institution.

In editing a journal I am constantly on the alert for ideas that will be helpful to those of us who work in the pharmaceutical field. One source where I seek information is in the addresses of scholarly men. In my search this year the most helpful idea I have gleaned was from the commencement address of President Carter Davidson of Schenectady's Union College. Speaking at the University of Buffalo, he in substance said, "We Americans need to be warned against words and ideas that look much alike but have different effects. For example, we confuse *size* with *importance*, *speed* with *progress*, *money* with *wealth*, *authority* with *wisdom*, *religion* with *theology*, *excitement* with *pleasure*. We have confused *training* with *education*. *Training* is a process by which a pupil is taught to perform an act by *imitating*. *Education* should acquaint a student with ways of *analyzing* prob-

lems he has never before seen.¹ Then I realized that throughout all the years of my service we have been *training* students rather than *educating* them. The time is opportune now that we are in the business of reconstructing the curriculum; we will do well to bear in mind that from the prepharmacy to the graduate level our objective should be *not* training, but *educating*. And if we *educate* instead of *train*, no man in this room will live to see the day when there will be an oversupply of pharmacists, for the areas of service and the avenues that lead to them have become worldwide. This is the thought I would leave with you now that we have come to the parting of the ways.

And as we part, since this is a family gathering, and so many have asked me of my plans for the future, it might be proper for me to say a word about what I hope the future has in store. So many have been concerned about my health. It seems when a man is retired it is because of ill health. I was retired because of the passage of time. Physically, I am as good as I look. Mentally, no man can tell when he weakens—like a drunk man, his judgment is gone. When the pangs of labor, which the University of Arizona is now experiencing on the occasion of the birth of her youngest baby, are over, and the infant is well on its way, if my pen does not falter and my memory does not fail, I plan to write the story about the pharmacy and the pharmacists of my day. That will be my job unless an emergency arises, and Nevada, or Alaska, or the Islands of the Sea demand the services of an expert pharmaceutical obstetrician. If that should happen, then one must go where duty calls. That is the code under which obstetricians, and pioneers, and Presbyterians work.

I have been trying to find words to express my appreciation for what you have done for me and my family on this never-to-be-forgotten occasion. I found when I wrote them my vocal apparatus failed when I tried to read them. So I have recorded here, on the printed page, those things I thought I could say without too much emotion. What is

¹ Time, June 23, 1947.

left unsaid I know you will read between the lines and understand.

It has meant so much to me to have Dr. Oggel here on what he calls my "red letter day". Of all the pastors I have had in my time he is the personification of democracy, justice, and truth. I admire him for that, but I love him because once I had to fight for him. And when he left Nebraska and went to New Jersey where the need was greater, he told me I would love him for that reason with a zeal greater than I have ever had for any other pastor; and as the years passed I found what he said was true. And that started me to thinking. He had given me the clue as to why—when I write to any or all of these comrades of mine that have fought so unselfishly through the years to place pharmaceutical education upon a dignified basis, in ending a letter an uncontrollable impulse often comes over me to close it with "*Yours gratefully*", but always with "*Yours affectionately*". That's why Rudd ended his greeting that way.

Above the choir loft, in a dignified Presbyterian Church in Tucson, where we worship, is a beautiful window done in colored glass. The scene is a typical Palestine landscape. The ground is covered with rocks and prickly pear, and growing in between them here and there is a struggling palm wilting beneath the desert sun. There are rugged hills beyond. It is a replica of the Arizona desert scene outside the church's walls, stretching away as far as the eye can reach to the majestic Catalinas. In the foreground of the picture stands Ruth clinging to and appealing to her mother-in-law. The first time I saw it I wanted to break into song and plead as Ruth plead—"Entreat me not to leave thee nor turn from following after thee, for thy people shall be my people, and thy God my God". And in the same spirit I make that plea, my plea, to you tonight. May we always remain a united family in the service of humanity.

In the preparation for this occasion I want you to know that not for a single moment have I permitted the thought

to enter my mind that this was to be *my* party. It is *not*. This is a party honoring Joseph P. Remington, a great pioneer in pharmaceutical education, who left his lasting impress upon the souls of thousands of young men and women who have carried his ideals and his idealism to the four corners of the earth.

If I, as the twenty-fifth Remington Medalist, had it within my power to do so, I would confer upon him on this occasion, the one-hundredth anniversary of the birth of the great Remington, the title and rank of—*Remington the Great*.

James Cutbush—Author, Teacher,
Apothecary General*

H. GEORGE WOLFE

Merck & Co., Inc.

Aware of my special interest in the period of the War of 1812, Dr. Urdang recently directed my attention to James Cutbush who served as assistant apothecary general during that war. Despite the publication, in 1919, of a small biography,¹ despite occasional references in literature, this early American scientist has remained largely unknown.

There is a quality of mystery in the fact that many basic biographical details should still be unknown about a man who was quite prominent in his lifetime—a lifetime, it might be added, spent within the limited area of Philadelphia and New York state. But what makes the retelling of Cutbush's life intriguing is not merely the *historical* mystery it presents. There is involved also a *human* mystery: the imponderable quality that enables men to conquer life against seemingly hopeless odds. It might even be said that his was a typical American success story.

* Presented before the joint meeting of the Section on Historical Pharmacy of the American Pharmaceutical Association and the American Institute of the History of Pharmacy at Milwaukee, Wisconsin, on August 28, 1947.

Consider the odds in his case. In the Philadelphia of 1790, a poor English stonecutter dies, following only by a few months the death of his wife. There remain, almost penniless, four orphaned children: Edward, 18; Ann, 8; William, 5; James, 2.² The girl dies eight years later. The boys, in 1790, seem of interest only as problems of local charity. Meet them again, 24 years later, and you will find Edward ranking senior surgeon of the U. S. Navy—the equivalent of today's surgeon general; William, a West Point graduate and captain of engineers; James, a chemist of wide reputation and assistant apothecary general of the U. S. Army.

What was the family background of these remarkable men? The elder Edward Cutbush and his wife had migrated to this country from Wokingham, Berkshire County, England.³ A first son was left behind and his descendants are said to live still in the old country. Edward Cutbush is described as a stone-cutter and carver⁴ but one author states that he had once been a sculptor with "considerable artistic talent."⁵ We may assume that Cutbush senior *was* an artist whose endeavors were frustrated by the necessity of providing the daily bread for his family. In this task he did not succeed to any considerable degree. We know that his oldest son, Edward, had entered Philadelphia College but that he was forced to give up his academic career, in 1786, in order to go to work. The death of his parents within the next four years left Edward, junior, the head of the family.

But now it becomes apparent that the father, despite his reduced circumstances, had been a man of culture and of good standing. His death was mourned not only by the orphaned children but by prominent citizens who had esteemed him as a friend. Among them were Dr. James Hutchinson of Pennsylvania Hospital and William White, first Episcopal bishop of Pennsylvania. These two became the sponsors and bondsmen of young Edward and made it possible for him to enter Pennsylvania Hospital as a medical student.⁶ His first duties there were those of "apothecary and dresser." Right here is illustrated the close interrelationship of the health professions during the first decades of the Republic; right

here, too, the explanation *why Edward is no less important to our story than James*; why the Navy surgeon and the Army apothecary were brothers in blood and in science.

Edward received his M.D. degree in 1794, was surgeon general of the Pennsylvania State forces in the Whiskey Rebellion, married, and resided for a time in Philadelphia. He then gave up his private practice and became one of the first surgeons appointed to the reconstituted Navy of 1799. The career of a surgeon in the armed forces is usually drab and uneventful. Edward Cutbush's long service, however, made him a firsthand observer of the historical highlights of his day. He had been through the Whiskey Rebellion; later he was to witness the fall of Washington. And now, in 1799, his assignment was on board the 44-gun frigate *United States*, proud sister ship of the *Constitution*. The ship made this particular trip, Cutbush's first crossing, in order to take three United States envoys on a peace mission to Paris. It was this mission that forever ended the danger of war with France but that also ended the reign of the Federalist party.

During the latter half of 1801 and again for one year, from 1803 to 1804, Edward was home on leave in Philadelphia. Though he had his own household now, he was still responsible for his younger brothers. Several letters written by him during this period have been published.¹ Although he mentions brother William, we find no reference to James. William, of course, was older and the problem of finding a suitable position for him had arisen as early as 1799. But some of these letters were written as late as 1804, when James was 16 years old. Some notice about his boyish pranks or about his schooling should have been of interest to any correspondent of his eldest brother. Instead, James Cutbush's biographer is forced to report: "Indeed it will probably remain a query as to where he was educated". This statement may well be considered as final since it comes from the pen of Edgar F. Smith, late Provost of the University of Pennsylvania, who himself was a chemist and lifelong student of the history of American chemistry.

I. Philadelphia Chemist and Apothecary

The mystery of Cutbush's education deepens when one realizes that, in 1808, James Cutbush stepped before the public as a full-fledged chemist and accomplished writer. He was then 20 years old. I like to think that a deeper significance lies in the fact that no one school, no one teacher can claim the credit for his education. In a very real sense Cutbush becomes the "product of Philadelphia." There is an atmosphere about the city in which science and scientists thrive. Philadelphia's most famous citizen may have set the pattern by the example of his own scientific experiments and by his sponsorship of scientific associations and institutions. The local trend was towards education in science; and to this day, Philadelphia has remained a center for schools and publications of science. As James Cutbush himself put it, in 1808, "every useful kind of learning shall here fix a favorite seat and shine forth in meridian splendour".¹⁰

Cutbush, the orphan boy, made his own contribution to his city. He was an important factor in the development of Philadelphia as a center of chemical industry.¹⁰ For, Cutbush was more than a good chemist, he was an untiring advocate of *applied* chemistry, a promoter in the best sense of the word. From the nature of his very first publications it is apparent that the mere theory of chemistry did not satisfy him. Systems of elements, symbols, and formulas had yet to be invented. Had he cared he could have done what some of the great chemists did of whom he said that they "cultivated and enriched the new theory of chemistry with discoveries which will forever give immortality to their names".¹¹

But he was a thoroughly practical individual. Maybe he knew that his time was short. He most definitely knew that the time for his country was short. Embargoes, blockades, threat of war were the order of the day. The pros and cons of domestic manufacture were no longer topics for heated arguments in coffee and ale houses. Overnight, home industry had become a necessity if the young Republic was to survive.

No other group of products offered more opportunities than those created by chemistry. This was the campaign on which Cutbush embarked; this was the cause to which he devoted his scientific knowledge. He had the fortunate, and for his purpose essential, gift of describing science in terms everybody could understand. To reach his audience, Cutbush used every medium at his disposal: newspapers for the laity; books and articles in scientific magazines for those already engaged in the field; public lectures for all.

In 1808, a series of articles appeared in Philadelphia's famous newspaper *Aurora*. The essays dealt with the "Application of Chemistry to Arts and Manufactures" and discussed such diverse subjects as potato spirit, beer, bread, and glue. The author hid his identity behind the initials "J. C." but disclosed a well-grounded knowledge of chemistry and of industrial processes. His apparent youth was betrayed only in the "boyish ardor" with which he tried to arouse the interest of "you enlightened citizens, men of science and improvement, artists and manufacturers".¹² In view of the troubled state of national affairs, it is significant that the very first of these *popular* articles is concerned with gunpowder. The first article of Cutbush's to appear in a *scientific* magazine, in the same year of 1808, likewise dealt with an explosive, mercury fulminate. A logical beginning for the chemist who would crown his writing career with a highly praised book on pyrotechny.

Both these publications on explosives, incidentally, prove Cutbush's ardent interest in the history of science. Cutbush makes it a point to trace the historical development of the chemicals or processes he describes, frequently furnishing copious notes from and references to the literature.

Cutbush was apparently a "joiner" and got on well with people. One of his first associations was with Lodge No. 2 of the Free Masons which he joined in 1810 and of which he became president in 1811.¹³ But even among his social contacts, Cutbush never forgot his campaign for the promotion

of chemistry; he very often addressed his brethren on subjects taken from his beloved science which he described to his listeners as "the most useful in advancing all the operations of the arts, and the most rational for scientific amusement."¹⁴ There is no doubt that the young chemist thus reached many unsuspecting laymen and stirred in them a profound interest for chemical pursuits.

But his knowledge was esteemed not only by the uninitiated. James Cutbush was princeps inter equales. In 1811, the Columbia Chemical Society was founded in Philadelphia, including in its membership prominent American and foreign scientists. Two years later, the roster of this illustrious group was headed by the Hon. Thomas Jefferson, Patron, and James Cutbush, President.¹⁵ It was but 23 years since he had been left a poor orphan.

The Columbian Chemical Society was only one of many scientific groups that considered Cutbush one of their most prominent members. There was the Linnaean Society which chose him to deliver the Linnaean Oration of 1811, before the medical students of the University of Pennsylvania. In the same year, this society announced the appointment of a committee of three experts to whom "any plants, ores, or any mineral substances whatever" might be submitted for examination. James Cutbush was a member of this committee, a particularly pleased member, we may assume, since the purpose of this work was "to assist in obtaining a full knowledge of the medicinal and dying drugs indigenous to our soil; to expedite the discovery of useful metals; *to aid the manufactories of our country*, as far as they are connected therewith; and to remove the inconvenience of individuals not possessing an acquaintance with natural knowledge."¹⁶

As may be expected, Cutbush was "one of the few of the original society of Philadelphia for the promotion of National Industry."¹⁷ In 1811, he addressed still another group, the Society for the Promotion of a Rational System of Education, before an audience consisting of "the very best people

of the city."¹⁸ Cutbush's purpose here again was in line with his campaign; he advocated the inclusion of a definite amount of science teaching into the school curriculum. This educational group, too, seemed to be greatly impressed with the young scientist, for he was soon elected vice president of the society.¹⁹ It goes without saying that Cutbush belonged also to that most venerable of scientific associations, the American Philosophical Society.²⁰

Gratifying as were these activities and honors to a young man in his early twenties, they could not fill the prosaic need of keeping body and soul together. It was another occupation that served this very vital purpose. A commercial advertisement in a Philadelphia newspaper presents us with a clue as to how Cutbush earned his livelihood during these years:

Bleaching Liquor, Artificial Musk, Phosphate of Mercury and
other chemical Preparations, prepared and sold by
James Cutbush
Chemist and Apothecary
No. 25 South Fourth Street, Phila.
where complete collections of chemical reagents are kept as
usual.²¹

We see from this ad that Cutbush was a manufacturing chemist who supplied chemicals and reagents for industrial use, for home experiments and study, and for the needs of retail pharmacists.

Another source of income were public lecture courses on chemistry which James Cutbush began to hold in the winter of 1810, at first in cooperation with his brother Edward, then continued by both as separate undertakings.²² James Cutbush's announcements speak of "the ladies and gentlemen composing his class," a fact that betrays a somewhat liberal point of view on the lecturer's part. Dr. P. K. Rogers, another prominent chemical lecturer, made it a strict point to divide his classes according to sex.²³

One more recognition of Cutbush's work was his appointment, in 1813 or earlier, as professor of chemistry, mineral-

ogy, and natural history at St. John's College in Philadelphia. Here, again, enters the element of mystery that obscures so many details of Cutbush's life. We learn from city directories and from Cutbush's own writings that St. John's College existed. Yet neither the archives of St. John's Lutheran Church nor of the State contain even a reference to this school nor to a charter granted in that name.²⁴

Cutbush's pen was not idle during these years. He wrote articles on various subjects and published, in 1812, a book on *Hydrostatics*, an elementary and practical description of hydrometers and their application. His most important work, up to this period, appeared in 1813 in two volumes. It was called *The Philosophy of Experimental Chemistry* and represented one of the first chemical textbooks written by a native American.

The year was 1812 when Cutbush entered upon the venture that has made him an important figure in the history of our own profession. He announced a lecture course on theoretical and practical pharmacy.

"The subscriber, at the solicitation of several medical gentlemen, proposes to give a series of *Lectures on the Theory and Practice of Pharmacy*, accompanied with the necessary chemical elucidations. Tickets may be had at 25 South Fourth St. Price 20 dollars. James Cutbush."²⁵

We do not know how long these lectures were continued but the message in that brief announcement is of the utmost significance. With it, Cutbush established himself "as the first and, for decades, the only *pharmaceutical* teacher of pharmacy in America."²⁶ Theoretical pharmacy and the teaching of pharmaceutical subjects had been, and for some time continued to be, the concern of physicians and of their students. James Cutbush was neither; he was a pharmacist. He had earned this title not by education or license—which did not exist in his day—but by choice. At that time, a man could choose the title that seemed most appropriate to his occupation.

Besides, scientific activities of individuals frequently covered wide and diverse fields.²⁷

Cutbush, at any rate, referred to himself—in his public announcements and in city directory listings—as apothecary, chemist, druggist, or rather as a combination of any two.²⁸

Having claimed Cutbush as one of our own, we should further outline the limitations of that claim. His commercial advertisements show that he dealt in industrial, household, and laboratory chemicals. There exists, so far, no evidence to show that Cutbush ever filled a prescription, at least during his civilian career. The choice of subjects for his numerous publications—the only full record we have of the man—betrays an utter lack of interest in the medicinal use of drugs or in chemicals that are of special therapeutic importance.²⁹ True, ether was one of the first compounds to which he devoted a paper, but it need hardly be pointed out that in 1809 anesthesia was still in the distant future. Nor, in this connection, could Cutbush be blamed for employing nitrous oxide in the fashion of his time: "at the request of several ladies, the nitrous oxide or the exhilarating gas" was exhibited as a stunt during his public lectures.³⁰ None of Cutbush's papers deals with "The chemical properties and medicinal uses of arsenic", or such similar subjects as were delivered by some of his fellow-scientists before the Columbian Chemical Society.³¹ When Cutbush discussed Arsenic before the same audience, his theme was "On the oxyacetite of Iron as a Test or reagent for the discovery of Arsenic".

Why, then, did he suddenly assume the function of a pharmacy teacher? The answer is simple. It was but a logical step in his campaign to promote industry by furnishing the tools of knowledge. Cutbush, as his writings show, was thoroughly familiar with foreign texts. He could not have failed to notice how many of the well-known continental chemists were pharmacists, how many of their experiments and discoveries had been made on the very premises of retail drugstores. Having brought his message to many and diverse

groups, what more fruitful field remained than the pharmacists residing in America's largest city? Here were the men whose professional tasks brought them not only in close contact with chemistry, but required them to be their own manufacturers. A more profound knowledge of chemistry was bound to make them better pharmacists. But we must assume that this was only a secondary consideration on Cutbush's part. At that time, he was not thinking so much of public health as of the founding of industries; and there is no doubt that some of his pharmacist students used the new knowledge they had gained and extended their pharmaceutical manufacturing activities or even ventured into fields of wider productive application.

Cutbush, on the other hand, through his preoccupation with "theoretical and practical pharmacy", became familiar with problems that he had hitherto neglected. His later appointment as assistant apothecary general was certainly predicated, to a large degree, on this work in pharmacy. In fact, this very experience may have caused him to apply for service in the medical department and thus formed the basis of his entire future career.

Cutbush's biography cannot take the form of a "personal history." "A search through ancient volumes in many libraries failed to bring to light any facts" bearing on James Cutbush, the *man*.²² For six years, from 1808 to 1814, his story is told by his writings and lectures. For the next six years, his life must be sketched through the history of the Army Medical Department.

II. The Rise and Fall of a Pharmacy Corps

Economizing peacetime congressmen had not allowed the Army to utilize the experience which the medical officers had gained during the Revolutionary War. There was no thought of extending further the knowledge and organization that had been achieved through trial and error. On the contrary, most of those achievements had long since been

discarded. To make matters worse, the medical profession itself was "entirely ignorant" of such vital matters as hospital management, camp hygiene, and of policing the "diseases peculiar to troops."²² There existed only *one* comprehensive American book on the subject, published as late as 1808. Its author was none other than James Cutbush's brother, Edward.

The scope of the Navy surgeon's book is expressed in its title:

*Observations on the Means of Preserving the Health of
Soldiers and Sailors, and on the Duties of the Medical Depart-
ment of the Army and Navy; with remarks on hospitals and
their internal arrangement.*

The book does not restrict itself to a detailed description of medical service routine as practiced in the United States but rather attempts to outline an ideal to be achieved. Apothecaries have a definite place in Edward Cutbush's concept of an efficient medical administration. At the same time, he informs us, by implication, how the drug supply problem was handled at this time. Purveyors bought stocks from drugstores; the surgeon's assistants put up the prescriptions. In Edward Cutbush's opinion, this system might work while Army contingents are stationed near the big coastal cities, but not when expansion toward the inland areas should continue. He further advocates that the services establish "a national depot of medicines" which would not only ensure the purity of all chemicals manufactured there, but "would save from 1 to 300 per cent, and even more." The apothecary's department, if it were established, should prepare "all tinctures and ointments" and should, in general, receive, prepare and issue medicines, dressings, etc., on surgeons' requisitions. Grown careful through nine years of naval service, Cutbush recommends to the apothecary—who so far existed only in the pages of his book—that he obtain duplicate receipts for all articles issued so that he may present the vouchers when accounts are rendered. These vouch-

ers "should be indorsed and numbered to prevent confusion among his papers."³⁴

These quotations may illustrate the thoroughness with which Edward Cutbush approached the entire problem of medical care for the services. Unfortunately, those in power neglected to read his book. Had they—or their successors—done so, they would have found the author, in his preface, comparing the inducements offered to medical personnel in the various countries. It was in 1808, when Edward Cutbush concluded that nations confer Army ranks "according to the liberal or illiberal opinion they entertain of the profession."³⁵

Unlike the Army, the Navy and its services had been systematically built up since 1799, and it is no accident that a Navy surgeon would write a book of this kind. How desperately the Army needed a reorganization of its medical department may be shown by the most notorious example of the period, the disaster that befell the soldiers of Brigadier General James Wilkinson on the lower Mississippi. In the peaceful year of 1809, 764 out of his 2,000 fresh troops died from disease.³⁶ Congress investigated and found that, among other things, the camp-site had been unwisely chosen by Wilkinson, provisions had been unwholesome, hospital stores utterly inadequate.³⁷ These stores Wilkinson himself described later as "scarcely sufficient for a private practitioner."³⁸ There was a lack of mosquito nets and of funds with which to purchase necessities for the sick. Officers finally raised money among themselves for such purpose.³⁹ "It has been generally remarked that diseases in an army or navy destroy more than the sword"—Edward Cutbush had said it only a year before.⁴⁰

But even though this affair developed into a national scandal, no steps toward reorganization were taken. The public of 1810, and its representatives in Congress, simply were not in a position to appreciate the importance of these problems. How could they be expected to recognize what even the two most influential men in the army failed to ob-

serve. These two were the Secretary of War, Eustis, and the highest ranking general, the same Wilkinson who had been in personal command of the affected contingent. Neither made subsequent efforts to improve medical services—yet both were physicians and had once practiced medicine. It was not until 1813—when nine months of war had vastly aggravated the situation—that Congress took action.

An act of March 3 provided that "for the better superintendence and management of the Hospital and medical department" a physician and surgeon general, as well as an apothecary general be appointed, with annual salaries of 2,500 and 1,800 dollars respectively. Dr. Francis LeBarron, a former Navy and Army surgeon, was chosen for the position of apothecary general.⁴¹

At that time, James Cutbush was still busily engaged in his civilian pursuits. His business as "chemist and druggist" was carried on at the old location, 25 South Fourth Street.⁴²

He continued to lecture, teach, and devote himself to the associations of which he was an officer or a member. He also found time to prepare for publication *The American Artist's Manual or Dictionary of Practical Knowledge in the application of Philosophy to the Arts and Manufactures*. This two-volume work appeared in 1814 and was, as the title indicates, an enlargement of the original essays in the newspaper *Aurora*.⁴³ It contained, however, not only information of immediate practical use to industry but also provided a complete picture of the knowledge of chemistry of the day, including Uranium, "a new metallic substance discovered by the celebrated Klaproth in the mineral called Pech Blende." Cutbush explained in the preface that he had incorporated into his book many sections taken from European writings but that the additional original essays were "the result of much study and practice, having devoted the greater part of his life, to chemical pursuits." Coming from Cutbush, this statement by a very young man did not sound presumptuous.

James Cutbush left all these activities on August 12, 1814. It was on that day that he was appointed assistant apothecary general of the United States Army.⁴⁴ There must have been many who honored, yet regretted his decision to leave civilian life. The new pharmacist officer served at first in Philadelphia and was then attached to the Northern Department of the Army.⁴⁵

When Cutbush was appointed, heavy fighting raged along the Niagara frontier, a campaign that was to continue until November of that year. As assistant apothecary general stationed in Philadelphia, his duties included the collection and distribution of hospital stores. Later, when he was attached to a general hospital near the front, stores and medicines for the field hospitals would be forwarded to him; he would take charge of these supplies and issue them to the individual regiments.⁴⁶ During the second half of 1814, the principal general hospitals of the Northern Department were located at Burlington, Vermont, and at Greenbush, Plattsburgh, Williamsville, and Buffalo, New York. At times, these hospitals held many hundreds of patients.

An efficient, well knit organization had replaced the feeble efforts for the care of sick and wounded that had been prevalent during the first year of the war. A report on the Burlington hospital survives⁴⁷ which tells us that the more than 700 patients were distributed over 40 wards, attended by eight hospital surgeons and mates. Patients and rooms were kept immaculately clean; spitting on the floor was prohibited; bedpans and urinals were removed immediately after use; straw and bed sacks were burned at regular intervals. Attendants took prescriptions to the dispensary where they were promptly filled by apothecaries. Four of these were on constant duty.

The "Rules and Regulations for the Army" issued on May 1st, 1813, failed to define clearly the duties of the various new medical officers Congress had created. With respect to the apothecary general they merely stated that he "should

assist the Physician and Surgeon General in the discharge" of his duties.⁴⁸ The same "Rules" provided much more detailed information about the new uniform which was identical for all officers of the medical department, and quite ornate. It was not until December, 1814 that the War Department clearly defined the duties of the various types of medical officers. Concerning the "Apothecary General and his assistants" it was stated that they were to "receive and take charge of all hospital stores, medicines, surgical instruments, and dressings, bought by the Commissary General of Purchases" and that they were to "account to the Supt. General of Military Supplies for all expenditures of the same." They were further directed to "compound and prepare all officinals and put up and issue medicines etc. in chests or otherwise, conformably to requisitions."⁴⁹

Yet even before these detailed instructions had been issued, the apothecary general and his assistants had obviously done an efficient job. Stocks of medicines and equipment were on hand and supply well organized. This at a time when dissension in Congress and the almost traitorous opposition to the war effort by some state governments sharply curtailed available funds and greatly interfered with the military progress of the war. Only a few days after Cutbush's appointment occurred the event that symbolized the low ebb of America's fortune, the fall of Washington.

In attaining this victory, the British were greatly aided by a new weapon produced through chemistry—though not connected with the element which "the celebrated Klaproth" had recently discovered; the secret weapon of the day was the Congreve Rocket. James Cutbush, expert on explosives, indicated later that he was not impressed with the performance of this invention, "little calculated to injure and more to intimidate."⁵⁰ But that was exactly the effect the weapon had on the raw American militia who were put to flight by the novel contraption.⁵¹ A few weeks later, against fortified positions at Baltimore, the weapon proved less effective. It

was a rocket-firing cruiser—the only one then in existence⁵²—that inspired an eye witness to write down some immortal lines about “the rockets’ red glare.”

But on the field before Washington, we meet again the Navy surgeon, brother of the new Army apothecary. While the militia fled in confusion, Edward Cutbush attended the wounded marines of Commodore Barney’s command, that small band of intrepid men which formed the only serious resistance the enemy encountered on his way to the capital.⁵³ As a matter of fact, all three Cutbush brothers figured in the military news of August and September, 1814. It was on September 17 that William Cutbush was commissioned as a captain of engineers.⁵⁴ The country had done much for the orphaned boys from Philadelphia; they were now engaged in repaying their debt with full interest.

How well the apothecaries general had performed their duties, how firmly they had established the value of a professionally organized branch of pharmacy in the Service, became apparent after the war’s end. That, as we know, is the period which America traditionally devotes to a reckless dismantling of her military establishment. By an act of March 3, 1815, Congress reduced the Army to a minimum and many deserving officers were retired, simply because there was no room left for them.⁵⁵ To the Secretary of War, this seemed to imply the end of the Hospital Department and the necessity of discharging the physician and surgeon general, the assistant apothecaries general, and many other medical officers.⁵⁶

Yet, significantly, the President directed in May, 1815 that the apothecary general and two assistants be retained in the “Military Peace Establishment of the United States.”⁵⁷ The office of “Physician and Surgeon General”, however, was abolished and the Apothecary General became the ranking officer of the Medical Department⁵⁸ until 1818. In that year, there was appointed the first officer to bear the present title of “Surgeon General.”⁵⁹

When Edward Cutbush wrote his book on military medicine, in 1808, Army medical officers looked with envy on the medical service of the Navy. But the Army had made progress since then. In 1815, Edward Cutbush, now senior surgeon of the Navy, directed the attention of the Secretary of the Navy to the organization of the Army's medical department and recommended that the Navy adopt it. Brother James had, no doubt, given Edward authentic information about the Army department. It is interesting, therefore, to note that Edward Cutbush in his letter to the Navy secretary describes the Army organization as consisting of one apothecary general and eleven assistant apothecaries.⁶⁹

This number of eleven assistant apothecaries may be meant to include the assistant apothecaries general. Six men with this rank had served in the Army during the war.⁷⁰ Of these six assistant apothecaries general, at least two were old Army men and former garrison surgeon mates, Joseph West⁷¹ and David Neilson.⁷² An act of March 30, 1814, had authorized the President "to appoint so many assistant apothecaries as the service might, in his judgment, require; each of whom shall receive the same pay and emoluments as a regimental surgeon's mate."⁷³ The wording of this act is almost identical with a Congressional resolution of 1777⁷⁴ and does not refer so much to assistant apothecaries general as rather to their assistants and mates. Full apothecaries—such as assistant apothecaries general—rated with full surgeons.⁷⁵

But this authorization concerning assistant apothecaries is indicative of a reorganization and expansion of the pharmaceutical service. It had now become possible—and perhaps necessary—to enlist capable apothecaries from civilian life. The first assistant apothecaries general thus enlisted were James Cutbush, of Pennsylvania, and Christopher Backus, of Louisiana. Both were commissioned on August 12, 1814.⁷⁶ Two more men, Richard Brownell⁷⁷ and David Low⁷⁸ were made apothecaries general in November of that year. Backus, a Southerner, may have been assigned to the Southern Department of the Army.⁷⁹

In one respect, assistant apothecary general Low was more fortunate than his five fellow pharmacist officers. While we know little or nothing about their individual performance in the Army, Low served with Dr. James Mann who, after the war, published a book on his experiences as an army surgeon. Mann reserved the highest praise for Apothecary General LeBarron, and Low, the assistant. We learn that Low "in addition to his appropriate duties of issuing stores" frequently volunteered his other services to the hospital. These other services were of the greatest benefit since Low was considered one of "the most efficient surgeons of the army."⁷¹ About the professional background of Backus and Brownell, we know nothing. But we may assume that these assistant apothecaries general—as well as their predecessors of the Army of the revolution—owed their appointments to previous *medical* education or experience. If this is so, then Cutbush would not only be the first nonmedical pharmacy teacher in America; he would be the first—and for generations the only—pharmacy officer to attain his high rank exclusively through his background of knowledge of the basic science of pharmacy.

Joseph West had died before the end of hostilities.⁷² Thus, five assistant apothecaries general were left from which number the Presidential Order of May, 1815 authorized the retention of two in the Service. The choice fell on Cutbush and Backus.⁷³ Evidence indicates that *Regular* Army men were not counted in the limited number of officers allowed. Cornelius Cunningham, of Washington, a former garrison surgeon mate, was commissioned assistant apothecary general in June, 1815,⁷⁴ possibly to replace the late Joseph West. He resigned in 1820. There were thus three assistant apothecaries general in service between 1815 and 1820, instead of the legal limit of two.

The retention of LeBarron, Cutbush, and Backus was at first merely "provisional," pending further legislation by Congress. The ever changing regulations were neither in the interest of the War Department nor of the individual

medical officers. On December 27, 1815, the Secretary of War made, therefore, definite recommendations to the chairman of the House Military Affairs Committee.⁷⁶ He advised creation of permanent ranks for an apothecary general and four assistant apothecaries. Consequently, a bill was passed on April 24, 1816, which provided for an apothecary general and two assistants and further stipulated "that the officers of the staff, provisionally retained by the President . . . be recognized in service under this act."

The functions of the apothecaries were soon to be vastly extended. Through two wars and the brief post-war period since 1815, the pharmacist officers had been responsible for receiving, preparing and distributing medical supplies. It will be noted that they never had been entrusted with the *purchase* of these items.⁷⁶ But, in 1818, the office of the "commissary general of purchases" was abolished by the Army. Consequently, "that portion of his duties which pertained to the Medical Department" was transferred to the apothecary general and his assistants.⁷⁷ These new responsibilities were accompanied by a burden of red tape. General Orders from the War Department, issued in September 1818, outline the new—and the old—duties at great length:

Apothecary General and His Assistants.

The Apothecary General shall, agreeably to the returns and requisitions of the several surgeons and mates . . . and to a standard supply table, make an annual estimate of the supplies of medicines, instruments, hospital stores, etc., required for the ensuing year . . .

The Apothecary general and his assistants shall purchase, according to this estimate, all medicines, hospital stores, surgical and other instruments, books and dressings, required for the public service of the army. The articles so purchased shall be carefully packed under their direction, and by them delivered . . . for transportation to the place of . . . use; and all parcels so packed shall be legibly marked with the name of the place . . . or of the regiment . . . for which they are intended, and accompanied with an invoice of the articles contained in them.

They shall compound and prepare such Medicines as may be thought necessary for the good of the service; cause suitable medicine chests to be constructed . . . and furnished to the several hospitals . . . ; and supply printed forms of the reports and returns required by the regulations.

They shall make quarterly returns of their purchases . . . accompanied with invoices of the articles purchased, for which they shall be charged; and Nothing will exonerate them from such charge, but the receipt of a surgeon . . . or other person authorized to receive supplies of this Nature, or a certificate on honor for what may have been expended in the Apothecary's department, stating for what purpose. If articles become damaged or unfit for use, they will not be taken off the books . . . to their credit until sold by order of the War Dept.

They shall make to the Surgeon General returns in detail, of the medicines, stores, etc., put up for, and delivered or forwarded to, the several surgeons . . . stating the numbers and marks of each . . . package . . . and to whom they were delivered.

The Apothecary General will make in October, annually, an estimate of the expenses of the Medical Dept for the information of the War Dept.

The Assistant Apothecaries General will purchase and issue whatever articles composing the yearly supply the Apothecary General may deem necessary to have purchased in their respective districts, making returns of the same to him.⁷⁸

Throughout the various organizational changes affecting Army apothecaries, Cutbush remained assigned to the Philadelphia district, where he now resided at 207 South Fourth Street.⁷⁹ There can be no doubt that his previous experience in manufacture and trade made him an even more valuable apothecary officer now that purchasing had become one of his responsibilities. Fortunately, we are in possession of a statement on Cutbush's performance during this period. On November 1, 1818, the surgeon general rendered to the Secretary of War a report on the Medical Department. It will be remembered that this date follows only by a few weeks the reorganization of the purchasing procedure and that there still must have existed a great deal of confusion about

the order forms and receipts which all medical officers were required to execute. Writes the surgeon general:

"The Apothecary's Department labours under all the inconveniences consequent upon irregularity and want of system, but both Doctor LeBarron and Doctor Cutbush, are well calculated for their duties, and I have no doubt will carefully perform them. Doctor Backus may make a useful assistant to the Apothecary General, but is not at all calculated for an independent public agent."¹⁰

Since 1818, per capita costs of medical expenses in the department went down, but hospitals were "regularly and abundantly furnished with every article of furniture, medicine, stores, etc., necessary for the comfort, convenience, and recovery of the sick." It was in 1822 that the Surgeon General thus attested to the well-functioning supply service of the medical department through recent years.¹¹ This statement of 1822 would have been extremely gratifying to the apothecaries general, but for one circumstance: their rank, title and department had become items of past history in 1821.

In March, 1821, Congress had once more reduced "the military peace establishment of the United States." This time, the strength of the army was practically cut in half. The budget did not allow for retention of the following grades, among others: assistant surgeons general, apothecary general, assistant apothecaries general. The holders of these offices were unceremoniously discharged.¹² The penny-pinching lawmakers may not have foreseen that their measure of temporary financial expediency would deprive many succeeding generations of soldiers of a service that so early in our history had so nobly begun.

It might have been some consolation to the departing apothecary general, LeBarron, had the two assistants been his old war companions Cutbush and Backus. But the men who, on June 1, 1821, *did* accompany their chief into civilian exile, were newcomers: C. G. Foster, of Louisiana, and Robert P. McCalla, of Pennsylvania; these two had taken the places of Cutbush and Backus only a year before.¹³

Backus had resigned in November 1819, one year after the surgeon general's somewhat critical remarks about him to the Secretary of War. Cutbush, luckily, had gone to West Point before apothecaries general were voted out of existence. To make this transfer possible, his commission had been changed to that of post surgeon on May 16, 1820. That grade, too, was abolished in the Army reduction measures of 1821, but the same regulations provided for the retention of 45 assistant surgeons with the compensation of post surgeons. Consequently, Cutbush was commissioned as assistant surgeon on June 1, 1821.⁵⁴

Cutbush did not know that he was leaving a sinking ship of military pharmacy. In going to West Point, he simply followed a call he could not resist. After a lapse of six years he would again have an opportunity to lecture on chemistry—and not in a public hall, waiting to see how many persons might be interested and willing to pay the subscription fee. In September of 1820 he was appointed Professor of Chemistry, Mineralogy and Geology at the Military Academy and thus became that institution's first full-time instructor in chemistry.⁵⁵

III. Interlude: Edward Cutbush versus U. S. P.

While the former apothecary now was far removed from pharmacy, his brother Edward became involved in a matter that was of great interest to pharmacists. The first edition of the *United States Pharmacopoeia* appeared in December, 1820. Drs. S. L. Mitchill and Lyman Spalding had been the leading sponsors of this enterprise.⁵⁶ In due course, copies of the U. S. P. were submitted to the War and Navy secretaries with a view of having the book recognized and utilized by the several Services. The Army Medical Department fully approved of the work and introduced it in short order. Not so the Navy. The Secretary of the Navy informed Dr. Mitchill, in June 1821, that he had submitted the pharmacopoeia "to Doctor Edward Cutbush, Senior Surgeon of the Navy, for his opinion and Report upon the utility of it for the Navy Service." Cutbush's report which his chief passed on to Dr. Mitchill, read as follows:

"I regret that I cannot give it my unqualified approbation of the work for the use of our Naval Surgeons. It contains many prescriptions which every physician ought to be capable of forming according to the age of his patient, and the effect he wishes to produce. I consider the Articles composing the *Materia Medica* as the tools or implements of the physician, which he is to use according to the extent of his knowledge of their virtues . . . , that no article entering into the formation of the prescription shall decompose, or be decomposed by another, and consequently rendered inert With this impression, I have no hesitation in declaring that many of the formulae are injudicious and others deficient in the important articles which rendered them useful . . . in short, Sir, I fear the work will not bear a critical examination. I think that . . . it would be well for the present to suspend any order on the subject of introducing it into "General Use" in the Medical Department of the Navy of the United States."

Cutbush added that even if the Navy were to make the use of this pharmacopoeia "optional", that action "would probably be considered as a sanction of the work in a National Point of View."⁷⁷ With the pardonable pride of the descendant of Lyman Spalding, James Spalding calls this a "curious" report and a "solitary exception" amidst wide acceptance of the work.⁷⁸ But we have evidence to show that Edward Cutbush's opinion was objective and without prejudice. In January of 1820, while the pharmacopoeia still was in preparation, Cutbush himself had brought the book to the attention of the Secretary of the Navy. "From the acknowledged talents of the gentlemen who have been engaged in this business it is reasonable to suppose that the work will be of much publick utility." An American pharmacopoeia, Cutbush said further in this letter, should be given the preference over any other, since it would describe valuable indigenous plants that in time could replace many expensive foreign drugs.⁷⁹

Our appreciation of the first U.S.P. as a trail blazer does not obscure the merits of Cutbush's "curious" insistence on individualized dosage and of his awareness to the problem of incompatibilities. This understanding was based on Edward Cutbush's outstanding knowledge of chemistry.⁸⁰ We

must admire the independence of thought, medical and otherwise, that is apparent in his letters. At a time, when Mitchell and other famous physicians freely prescribed secret formula medicines, Cutbush could proudly state: "I never do prescribe any article or combination of articles, without possessing some knowledge of their component parts."¹¹

Unfortunately, Cutbush was prevented from contributing his knowledge to the preparation of the second edition of the U. S. P. Assuring in advance a ready acceptance by the services, the Pharmacopoeial Convention of January 1, 1830 had invited the Surgeon General of the Army and the Senior Surgeon of the Navy to take part in the deliberations.¹² But Cutbush had been forced out of the Service a few months before this convention took place.

The senior surgeon of the Navy had been present, once more, at a high point of national history, but this time the incident proved fatal to him. It was Andrew Jackson's ascendancy to the presidency in 1829, an event that hit Washington officialdom with the impact of a bloodless revolution. If a newspaper of the day may be believed, Cutbush "had committed the great offence of not joining in the Hurrah for Jackson".¹³ Cutbush, holder of the oldest commission as a Navy surgeon, with 30 years of responsible and distinguished service behind him, could not be summarily dismissed. Instead he was ordered—to sea duty. Pleading his case in writing and in person to no avail, he had no option but to throw his commission on the Navy secretary's desk. He subsequently accepted a professorship of chemistry at Geneva College, New York. When that college added a medical faculty, Edward Cutbush became its dean. He died in 1843.

Mention should be made here of the career of the third Cutbush brother, William. He had joined the Navy as a youngster and been captured by Barbary Coast pirates. This experience seems to have prejudiced him against the naval service, for on June 15, 1808 he entered the Military Academy at West Point as a cadet. He was the twenty-third

engineer to graduate from the institution and was commissioned Second Lieutenant in 1812. He became a First Lieutenant shortly after the outbreak of war, a captain two years later, and resigned on October 1, 1817. William Cutbush became a civil engineer and, in later life was engaged in Government work, principally in connection with the fortifications around New York. He died in 1855.⁶⁶

IV. West Point Professor

In 1820, eight years after cadet William Cutbush had left West Point, professor James Cutbush arrived at the Military Academy. It was a fortunate circumstance for the United States Army that it had in its ranks a man who was so eminently qualified not only as a scientist but as a teacher of science.⁶⁷ Cutbush organized an efficient and thorough course. He taught theoretical and experimental chemistry to the first-year students. The second year was devoted to "chemistry in its application to the arts, manufactures, and domestic economy . . . along with mineralogy."⁶⁸

A few items of human interest have been preserved from this period. We know, for instance, that Cutbush "promptly received the startling corps nickname 'Split Me'". And while we do not know when and where he first met the lady who was to become his wife, it is stated that Mrs. Cutbush and her sister, Miss Fowler, graced West Point dances as the "belles" of the post.⁶⁹

The pen that since 1814 had been mainly devoted to paper work in connection with medical supply, again was employed in the service of science. In 1821 appeared a *Synopsis of Chemistry, arranged alphabetically, comprehending the Names, Synonyms, and Definitions in that Science*. This book, as the author remarked in the preface, was "hastily written" and elementary in approach since it was composed for the use of his students.⁷⁰ Two years later, Cutbush published another first or near-first in American scientific literature: *Lectures on the Adulteration of Food.*⁷¹

But whatever spare time James Cutbush had, he gave over to text studies and laboratory experiments pertaining to pyrotechnics. Fireworks had been well known to the ancients and were used by native tribes; in modern countries they had developed into a distinct art. Yet it was Cutbush's contention that everything known about pyrotechny was "confined to a few books and scattered in a desultory manner." His goal was to incorporate this knowledge into a scientific system "by presenting a connected view of the whole subject."¹⁰⁰

For this proposed work, he had collected the material through many years. By the end of 1823 he had the book almost completed—as nearly as he ever would. For, on the 15th day of December 1823 James Cutbush died, at the age of 35. But after his premature death, an element of mystery enters once more the story of the orphan boy who grew up to become a prominent scientist. The mystery concerns Clara Cutbush who now steps before the public as publisher—and editor—of her husband's last book. She stressed that great care had been taken to make up for "the want of the author's personal superintendence of the publication," a course doubly essential in deference to her late husband's scientific reputation and to the "numerous and generous" subscribers.¹⁰¹

And so appeared in "Philadelphia: Published by Clara F. Cutbush, 1825",

A System of Pyrotechny, comprehending the theory and practice, with the application of chemistry: designed for exhibition and for war . . . Adapted to the military and naval officer, the man of science and artificer.

The biographer who asks what manner of man James Cutbush was, may with equal curiosity inquire: what manner of woman was Clara Cutbush. Here was a lady of the early 19th century—middle class, subject to prevailing educational limitations for those of her sex. Yet she had the knowledge and initiative that were necessary to make a highly technical manuscript ready for the printer and to create a financial

basis by accepting subscriptions. Silliman's *American Journal of Science*, which published an announcement of the proposed publication, states that the proceeds from subscriptions would go to "the worthy family."¹⁰² This could be an indication that Cutbush had children. That he was loved and respected by his students is clear, not only from the inscription on his tomb at West Point but from the fact that the cadets subscribed most liberally to his book. In gratitude, Clara Cutbush dedicated the work to the Corps of Cadets.

Much of the story of James Cutbush, proponent of exact science, must be left to inexact imagination. He did not live in a remote century nor in a distant land. Yet we do not know the day of his birth, the name of his school, the fate of the first college at which he taught, the date of his marriage. We do not know whether he was tall or short, how he talked and how he walked. And still, in a sense, we know all we *need* to know about Cutbush. The products of his mind are preserved in the libraries. Such records as we have, reveal that he was far more fortunate than many other scientists. His contemporaries recognized Cutbush's achievements and gave him offices and honors. When he died, his home town paper proclaimed his philanthropy, his patriotism and his "extensive knowledge of chemistry."¹⁰³ Enough for a lifetime that had lasted only 15 adult years.

Still, the story does not end there. One hundred years after his death, when the American industry he helped to found had become a world leader, a modern chemist would discuss Cutbush's last book. He would call it "good authority today" and express doubt that "any later book on this subject is as valuable a guide to pyrotechny or so filled with erudition".¹⁰⁴

Posterity forever reevaluates the intellectual and human achievements of those who lived before. Examined thus, in the light of modern knowledge, the reputation of James Cutbush, apothecary and chemist, stands unimpaired. The laboratory of history requires no more rigorous test than that.

THE WRITINGS OF JAMES CUTBUSH

1808

The Application of Chemistry to Arts and Manufactures. (A series of essays published in the Philadelphia AURORA).

1. On the art of proving and analysing gun powder, with sundry remarks. (July 27)
2. On nitre and the Chinese blue lights. (July 29)
3. On the formation and first refination of nitre. (Aug. 2)
4. Refinement of nitre with a general theory of the operations. (Aug. 27)
5. Salt petre, rock-salt petre caves etc., of the western country, and the manner of working them to obtain the nitre. (Sept. 7)
6. On the manufacture of glaubers salt or sulphate of soda in the United States. (Sept. 12)

("The consumption of glaubers salt in this country is indeed greater than any other pharmaceutical preparation and we are furnished with it in abundance from our own manufactories")
7. On the carbonization of wood or the preparation of charcoal for gun powder . . . (Sept. 23)
8. On the German mod: of obtaining spirit from potatoes. (Oct. 4)
9. Continuation of the preceding subject. (Oct. 17)
10. Practical and theoretical observations on brewing. (Nov. 7)
11. Continuation of the preceding subject. (Nov. 24)
12. On the refining of liquors, as ale, beer, wine, etc., by isinglass or fish glue . . . (Nov. 26)
13. General Remarks on the manufacture of fish glue, common glue, etc., and on gelatin and albumen. (Dec. 15)
14. On the mode of obtaining Magnesia which may be practical in the United States. (Dec. 17)
15. Continuation of the preceding subject. (Dec. 20)

**Useful Cabinet*

**on Mercury Fulminate* (Medical Museum, ed. by J. R. Coxe, Phila.)

1809

**On the formation of Ether.* (Medical Museum, Phila.)

*Not examined by this writer.

1811

- Linnaean Oration.* (Free-Masons Magazine and General Miscellany. Philadelphia, 1:129,223 (May, June))
An abstract of Dr. Herschell's Theory of the Sun. (Free-Masons Magazine, 1:385 (August))
**Historical Sketch of Chemistry.* (Free-Masons Magazine (Dec.))
**The value of the hop to brewers.* (Medical Museum)

1812

- **An Oration on Education,* before the Society for the Promotion of a Rational System of Education
**Hydrostatics*

1813

- The Philosophy of Experimental Chemistry* in two volumes, Phila.
On the prognostic signs of the weather. (Memoirs of the Columbian Chemical Society of Phila. 1:26 (1813))
On the oxyacetite of iron as a test or re-agent for the discovery of Arsenic. (Memoirs of the Columbian Chem. Soc. 1:70 (1813))

1814

- The American Artist's Manual or Dictionary of Practical Knowledge* in the application of Philosophy to the Arts and Manufactures. Selected from the most complete European Systems, with original improvements and appropriate engravings adapted to the use of the manufacturers of the United States. 2 vol. Phila.
Seltzer Water. (The Emporium of Arts and Sciences. Philadelphia. New Series. 3:456 (October))

1820

- An improvement in the electrical lamp.* (Am. J. of Sc. 2:332)

1821

- Synopsis of Chemistry,* arranged alphabetically, comprehending the Names, Synonyms, and Definitions in that Science. New York (e. g., "Morphia. A peculiar principle obtained from opium. It is to this substance that the narcotic effect of opium is attributed; but Desoime asserts, that the narcotic principle is a compound of morphia, and a peculiar acid. This acid is called meconic.")

1823

- **Lectures on the Adulteration of Food . . . and Culinary Poisons . . . with a means of discovering them and rules for determining the purity of substances.* Newburgh

On the formation of cyanogen or prussine in some chemical processes not heretofore noticed. (Am. J. of Sc. 6:149)

Remarks concerning the composition and properties of Greek Fire. (Am. J. of Sc. 6:302)

1824

On the composition and properties of the Chinese Fire, and on the so-called Brilliant fires. (Am. J. of Sc. 7:118)

Localities of minerals at West Point. (Am. J. of Sc. 7:57)

1825

A System of Pyrotechny, comprehending the theory and practice, with the application of chemistry; designed for exhibition and for war. In four parts: containing an account of the substances used in fire-works; the instruments, utensils, and manipulations; fire-works for exhibition; and military pyrotechny. Adapted to the military and naval officer, the man of science, and artificer. Phila.

REFERENCES

1. Smith, Edgar F.: James Cutbush. An American Chemist, 1788-1823. Philadelphia 1919.
2. Ibid.: p. 92.
3. Pleadwell, F. L.: Edward Cutbush, M. D. The nestor of the Medical Corps of the Navy. Annals of Med. Hist. 5: 337 (Winter) 1923.
4. Smith: op. cit., p. 92.
5. Pleadwell: op. cit., p. 340.
6. Ibid.: pp. 340-341.
7. Ibid.: p. 350, 358-363.
8. Smith: op. cit., p. 51.

"In his "Philosophy of Experimental Chemistry," published 1813, (1:273) Cutbush mentions an experiment to isolate potassium which "Dr. John Redman Coxe and myself . . . performed . . . ; but in our attempt we failed." Coxe was a professor at the University of Pennsylvania.

The book itself, Cutbush dedicates "to the professors and students of the University of Pennsylvania and the Trustees of St. John's College." (St. John's College was not in existence when Cutbush was a student.)

Why the dedication to the University of Pennsylvania and the reference to work done with (or under) a prominent teacher of this university? However, this evidence does not suffice to

establish Pennsylvania as Cutbush's alma mater. Cutbush was a friend and respected colleague of Coxe and may have used the facilities of the university at a time when he was already an established chemist.

For J. R. Coxe see: Kremers, E. and Urdang, G.: History of Pharmacy, pp. 174, 267.

9. Smith: op. cit., p. 10.
10. In the introduction to his last book, Cutbush reviews in retrospect the effect of his early popular articles "which from the letters received at that time, I flatter myself tended in some degree to advance the manufacturing interest which is connected with our individual and national prosperity ,and the permanent and practical independence of the republic." (James Cutbush, A System of Pyrotechny, p. XLI).
11. Smith: l. c., p. 24.
12. Smith's article on Cutbush in Dict. Am. Biog., New York 1930, 5:10. For a detailed listing of the 15 essays in Aurora and of all other known writings by James Cutbush see the bibliography at the end of this paper.
13. Smith: l. c., pp. 20-21.
14. Ibid.: p. 23.
15. Knite's City Directory 1814, p. LX; Memoirs of the Columbian Chemical Society 1:VII (1813); Dict. Am. Biog. states that Cutbush was "the first" president of the society.
16. Free-Masons Magazine 1:133 (May) 1811. The other two members of this committee were Samuel Jackson, M.D. and Samuel Benet, M.D. (See Cutbush, J.: A System of Pyrotechny, p. XLI.) Jackson's qualifications make it obvious that he was the member handling all problems pertaining to "medicinal drugs." For Jackson see Kremers-Urdang: l. c., pp. 175, 419.
17. Cutbush, J.: System of Pyrotechny, p. XLI.
18. Smith: l. c., p. 43.
19. Paxton's City Directory 1813, p. CIV; Knite's City Directory 1814, p. LVIII.
20. See by-line on the title pages of Cutbush's books, e. g. A System of Pyrotechny.
21. Smith: l. c., p. 32.
22. Cutbush, J.: Philosophy of Exp. Chem. 1:X.
Smith: l. c., pp. 33-35.
23. Smith: l. c., pp. 37, 39.
24. Knite's City Directory 1814, p. LX lists St. John's College and professor Cutbush. Lectures are "held back of St. John's Church,

Race St."

In the introduction to his *Philosophy of Exp. Chem.* Cutbush states that "the school establishment of the Lutheran congregation of the Church of St. John" had been enlarged and several professorships instituted. (p. X).

Smith: l. c., pp. 45-47 describes his futile efforts to locate pertinent records.

25. l. c., p. 34.
26. Kremers-Urdang: l. c., p. 204.
27. E. g., Dr. Rogers, one of the very few Americans preceding Cutbush as a chemical lecturer, was not only a chemist but an M.D. and an eminent geologist. Smith: l. c., pp. 37, 39.
28. **Examples:**
In a commercial advertisement, "chemist and apothecary" (Smith, p. 32). In the city directory for 1811, "chemist and druggist." City directories 1813, 1814, "druggist and chemist." Where he wished to emphasize his scientific qualifications, Cutbush did not use any of these "commercial" titles. An article in the *Free Mason's Magazine* (1811, p. 129) is signed "James Cutbush, Lecturer on Chemistry"; the notice announcing the lecture course on pharmacy is signed "James Cutbush" without any title.
29. A brief reference to the medicinal value of indigenous plants is contained in the Linnaean Oration of 1811, but this was delivered before medical students.
30. Smith: l. c., p. 35.
31. Ibid.: p. 29.
32. Smith: l. c., p. 32.
33. Brown, Harvey E.: *The Medical Department of the United States Army from 1775 to 1873.* Washington 1873, p. 82.
34. Cutbush, E.: *Observations*, pp. 139-141.
35. Ibid.; p. V.
36. Adams, Henry: *History of the United States of America during the administrations of Thomas Jefferson and James Madison.* New York 1930 5:175.
37. American State Papers, ed. Walter Lowrie et al. Washington 1832ff. Mil. Aff. 1:268-295.
38. Adams: l. c., p. 171.
39. Am. State. Pap.: vol. cit., pp. 281-283, 288.
40. Cutbush, E.: l. c., p. V.
41. Brown: l. c., pp. 84, 86.
42. Knite's City Directory, Philadelphia 1814; Paxton's City Directory for 1813 lists the address, erroneously, as "35 South Fourth St."

43. Cutbush, J.: *A System of Pyrotechny*, p. XLI.
44. See "Registers of Medical Officers" in Brown: *i. e.*, pp. 282, 290; "Army Register" in Davis, Paris, M.: *An authentick History of the late War between the United States and Great Britain*. Ithaca 1829, p. 289.
45. Appletons' *Cyclopedia of American Biography*. New York 1888 2:45.
46. For what is probably the only existing real-life description of an apothecary general's routine see Dr. Mann's letter about assistant apothecary general Low. Mann, James: *Medical Sketches of the Campaigns 1812-1814*. Dedham 1816, p. 258.
47. Mann: *i. e.*, pp. 242-247.
48. Brown: *i. e.*, p. 86.
49. Ibid.: p. 97; though more elaborate, these regulations are substantially the same as those applying to the apothecaries general of the Revolutionary War. See Kremers-Urdang: *i. e.*, p. 152.
50. Cutbush, J.: *A System of Pyrotechny*, p. 530.
The reputation of these rockets had been established in the bombardment of Copenhagen (1807) and at Leipzig (1813). In 1814 a rocket corps was created in the British Army. (Cutbush: *i. e.*, p. 531). At Washington, however, the British had only "a few rocket-men." (Armstrong, John: *Notices of the War of 1812*. New York 1840, 2:234). Some years later, the U. S. Army arsenal was manufacturing war rockets (Cutbush: *i. e.*, p. 526, footnote).
51. See report of the commanding general of U. S. forces in Armstrong: *i. e.*, 2:145. (Armstrong was secretary of war in 1814.)
52. "Ships and vessels belonging to the British navy at the commencement of the year 1814" in James, William: *Naval History of Great Britain*, London 1859, vol. 6, Appendix.
53. Pleadwell: *i. e.*, p. 372.
54. Newton, Simon (compil.): *Register of the Corps of Engineers, U. S. Army*, Washington 1887, pp. 5, 21.
"Army Register" in Davis: *i. e.*, p. 292.
55. Statement of the Acting Secretary of War. Davis: *i. e.*, pp. 273-276.
56. Letter of the Acting Secretary of War to the Major Generals of the Army, April 13, 1815. Davis: *i. e.*, p. 278.
57. General Orders of May 17, 1815. Davis: *i. e.*, p. 286.
58. Davis: *i. e.*, p. 289 compiles an Army Register, as effective in 1815. The top three names in the Medical Department are Francis LeBarron, Apothecary General, Christopher Backus and James Cutbush, Assistant Apothecaries. Then follows a listing of Hos-

pital Surgeons and Hospital Surgeon's Mates. Here is another example of the shorter title "assistant apothecary."

59. Brown: l. c., pp. 98, 107.
60. Pleadwell: op. cit., p. 372.
61. "Registers of Medical Officers," Brown: l. c., p. 266.
62. Ibid.; see also Heitman, Francis B.: Historical Register and Dictionary of the United States Army, Washington 1903, 1:1020; and Powell, William E.: List of Officers of the Army of the United States from 1779-1900, New York 1900, p. 52.
63. Brown, l. c., p. 266 (Registers of Medical Officers) states that David Neilson of Pennsylvania was commissioned assistant apothecary general in December 1812. We know, however, that the appointment of an apothecary general was not authorized until March 3, 1813. One can assume, therefore, that Neilson was a regular medical officer of the army—surgeon or surgeon's mate—who, in the absence of regularly appointed apothecary officers, was delegated specifically to direct pharmaceutical services.
It is worthy of note that neither Heitman nor Powell, in their respective army registers, lists a David Neilson from Pennsylvania. In view of the frequent discrepancies between the various published registers of army officers, this writer is inclined to follow Brown in matters relating to medical personnel. Nor do we believe that the army surgeon John Neilson from New York (see Heitman: l. c., 1:742 and Powell: l. c., p. 98) is identical with David Neilson from Pennsylvania.
64. Annals of the Congress of the United States. 13th Congress, First and Second Sessions, Washington 1854, p. 2815.
65. Kremers-Urdang: l. c., p. 152.
66. There exists no evidence to show that the comparative ratings prevailing in the continental army were changed in the War of 1812. In 1779, the ranks of Physician and Surgeon General and of Apothecary General were assimilated to that of Lt Colonel; junior surgeons and apothecaries to that of captain. (Brown: l. c., p. 50). This should make assistant apothecaries general the equivalent of majors.
67. Brown: l. c., pp. 282, 290; the date of August 2nd, mentioned on page 266 is a misprint.
For the same information see Davis: l. c., p. 289.
68. Heitman: l. c., 1:255; Brown: l. c., p. 266.
69. Heitman: l. c., 1:644. Brown: l. c., p. 266.
70. The General Orders of 1818 refer to "respective districts" of the assistant apothecaries general, see reference 78. Christopher

Backus of Louisiana should not be confused with another army officer, Electus Backus (of New York) who was stationed in Louisiana in 1809 and who testified on the disease situation among Gen. Wilkinson's troops, see reference 37. For Electus Backus see Heitman: *l. c.*, 1:179.

71. "Medical Sketches of the Campaigns of 1812-14." Dedham 1816, p. 246.
72. Heitman: *l. c.*, 1:1020.
73. Brownell and Low were honorably discharged on June 15, 1815. Heitman: *l. c.*, 1:255, 644.
74. Brown: *l. c.*, p. 266.
However, Powell lists an 1815 appointment of Cunningham to post surgeon, *l. c.*, p. 267.
75. Brown: *l. c.*, p. 101.
76. In 1775, the Massachusetts Provincial Congress appointed Andrew Craigie "medical commissary and apothecary" but this office was restricted to the Massachusetts troops. Kremers-Urdang: *l. c.*, p. 154.
When Craigie later became apothecary general, his duties did not include those of purveyor. The "continental druggist," William Smith, appointed by the Continental Congress, became "de facto, Chief Medical Purveyor." Legally, however, the Director General of the Hospital Department remained responsible for purchasing. Brown: *l. c.*, pp. 24-25; Kremers-Urdang: *l. c.*, p. 153.
77. Brown: *l. c.*, p. 109.
78. Ibid.: p. 112.
79. See City Directories 1816 (Robinson's), 1818, 1819 (Paxton's), 1820 (Whiteley's). Cutbush is not listed in the 1817 directory. (Issues of 1815 and 1821 could not be inspected, at this writing). In this connection, reference should be made to LaWall, C. H.: The Founding of the Philadelphia College of Pharmacy. Am. J. Pharm. 93:169 (March) 1921. This article devotes several paragraphs to James Cutbush and states that he "was in business at 25 South Fourth Street in 1819"; it further quotes a city directory listing of 1821 as proving Cutbush's residence at Philadelphia in that year. These statements, contained in an often quoted article, may be explained as follows:
 1. The information on 1819 is based on Smith's statement that Cutbush's commercial advertisement appeared in a newspaper of 1819. (Smith: *l. c.*, p. 32). It is suggested that this date in Smith is a typographical error and should read "1811." (As a similar example, on page 22 of the same work appears a date of "1881" which likewise should read "1811"). The address given

in Cutbush's commercial ad is 25 South Fourth Street. City directories do not list this address, in connection with Cutbush, after 1814. Further, Cutbush does not appear in directory listings after 1816 as "chemist and druggist" etc., but as "assistant apothecary general." This is quite in accordance with the fact that his rank was made permanent in 1816. Beginning with this year, if not before, he had neither the time nor, probably, the permission to carry on with a commercial enterprise. Since 1818 he was, moreover, entrusted with the purchase of supplies for the medical department.

2. Cutbush did not reside at Philadelphia in 1821 since he had left for West Point in 1820. His city directory listing of 1820 may have been mechanically transferred into the 1821 edition.

80. Brown: l. c., p. 122.
81. Ibid.: p. 125.
82. Ibid.: p. 126.
83. Ibid.: p. 282, "Registers of Medical Officers"; Heitman: l. c., 1:431, 653.
Thus, Cutbush cannot be considered "the last apothecary-general of the United States Army" (LaWall, C. H.: *Four Thousand Years of Pharmacy*. Philadelphia 1927, p. 470).
84. Brown: l. c., pp. 282, 126, 290.
85. Cutbush was not "professor," as implied by Brown, p. 290, but "acting professor." The full professorship of chemistry at West Point was created by an Act of July 5, 1838. See Cullum, George W.: *Biographical Register of the Officers and Graduates of the U. S. Military Academy at West Point, N. Y.* Boston & New York 1891, 1:25.
86. Kremers-Urdang: l. c., pp. 236-241.
87. Spalding, James A.: *The Life of Dr. L. Spalding*. Washington 1916, pp. 362-363.
88. Ibidem.
Edward Cutbush was not the sole dissenter, see Kremers-Urdang: l. c., p. 241.
89. Pleadwell: l. c., p. 376.
90. James Cutbush states that "my brother Edward" was one of the five first American chemists who individually succeeded in isolating potassium. (*Philosophy of Exp. Chem.* 1:273.)
91. Pleadwell: l. c., p. 377.
92. Kremers-Urdang: l. c., p. 245.
93. Pleadwell: l. c., p. 338.
94. Cullum: l. c., 1:109.
95. Henry Adams reminds us of the influence of West Point scientists

- who, as a group, "introduced a new and scientific character into American life." Adams: l. c., 9:236.
96. Cutbush, J.: Pyrotechny, p. XXXV.
 97. Dupuy, R. E.: Where they have trod. The West Point tradition in American life. New York 1940, pp. 162, 187.
 98. For a more detailed review of this work see Couch, J. F.: A Century Old Chemical Dictionary. Am. J. Pharm. 94:19 (Jan) 1923.
 99. Urdang, George: Pharmacy's Part in Society. Madison 1946, p. 46.
 100. Pyrotechny, pp. XXXVIII-XXXIX.
 101. Ibid.: p. V.
 102. 9:173 (1825).
 103. National Gazette, Philadelphia. Dec. 23, 1823.
 104. Munroe, Charles E.: Book Review of Smith's biography of James Cutbush. J. Am. Chem. Soc. 43:1745 (July) 1921.
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WANTED!!!

The School of Pharmacy of the University of Arizona is in the market for a complete set of the Proceedings, Year Books, and Journals of the American Pharmaceutical Association and for a complete set of the Proceedings of the American Association of Colleges of Pharmacy from 1900 to 1915 inclusive. Address, giving condition (bound or unbound) and price, Rufus A. Lyman, University of Arizona at Tucson.

NEW IN THE FAMILY

Edmund John McLaughlin.—Born September 20, 1947, first son and third child of Prof. and Mrs. Edmund H. McLaughlin, Philadelphia College of Pharmacy and Science.

Melvin Hoevel, Jr.—Born October 24, 1947, son of Mr. and Mrs. Melvin Hoevel, Sr., Cincinnati College of Pharmacy.

Virginia Louise Bliven.—Born December 9, 1946, daughter (by adoption) of Dean and Mrs. Charles W. Bliven, The George Washington University.

Conrad J. Floridia, II.—Born November 30, 1947, son of Prof. and Mrs. Conrad J. Floridia, Fordham University College of Pharmacy.

Bert Newton Nash.—Born January 2, 1948, son of Mr. and Mrs. Joe Nash, University of Texas.

Linda Claire Jancke.—Born January 9, 1948, daughter of Dr. and Mrs. Paul J. Jancke, University of Nebraska.

The President's Address

ARTHUR H. UHL

American Institute of the History of Pharmacy

General

This year we are entering into the seventh year of work of the Institute. Last year, after five years had passed, we prepared a rather detailed report of what had been done. That report on the First Five Years of the American Institute of the History of Pharmacy stood as a record upon which the profession could evaluate the accomplishments and could judge whether or not the Institute had fulfilled its promises and obligations and whether or not it had a rightful place within the organized profession.

It has been the feeling of the Officers and Directors that the Institute, if it has justification as a part of the profession, must serve as a unit adding to the functional processes of pharmacy rather than a duplication of work already being done. I am sure whatever has been done, irrespective of its intrinsic merits, has been original in character and, furthermore, has been helpful to the profession on the whole.

Membership Drive

On this basis the officers decided to increase the individual membership of the Institute. This was done particularly for three reasons: 1) The money obtained from the increase in membership would help in the conduct of the Institute; 2) It would give a larger number of people an opportunity to take advantage of and pleasure in the work which we are trying to do; 3) The fact that an increasing number of people carries membership in an institution devoted to the non-technical aspects of the profession cannot help but add to the prestige of the profession at large. The results of this membership drive were not too encouraging.

One hundred and sixty-seven invitations were sent out to a select group of individuals of whom not more than twenty-seven responded favorably. We appreciate, and extend a "thank you" to those who did respond to the request. During the coming year we intend to again give time and thought to the problem of membership and we will welcome any suggestions from any of you relative to this matter.

Financial Backing

The Institute has never been able to operate on revenue obtained from memberships, but has been fortunate in that certain individuals have thought well enough of what the Institute has done to give financial support from year to year. It gives me, once again, much pleasure to express our very sincere gratitude to our third Vice-President, Mr. A. J. Horlick, for the substantial help which he so generously and willingly has given us. Obviously, the work done at the Institute is in direct proportion to funds available. It is the desire of the officers that a large budget be obtained in order to increase activity in areas which come well within the scope of the Institute and to definitely secure its maintenance.

The A. I. H. P. and the University of Wisconsin

The University of Wisconsin has extended a liberal and generous hospitality to the A.I.H.P. since its start. In the last months, however, a still more definite relationship has developed.

I am glad to be able to report to you that a definite connection has been made between the Institute and the University of Wisconsin with the appointment of the Director of the Institute as Professor of the History of Pharmacy. The University has made definite progress in the work in History of Science. It now has a professorship in history of biological science, physical science, history of medicine, and history of pharmacy. I am sure I can tell you without hesitation, that the work of the A.I.H.P. on the campus since

1941, has stimulated this activity and that this appointment places pharmacy in a position which means a recognition of the part which it has taken and is expected to take in the work being carried on at the University. This does not mean that the Director will leave the Institute. Arrangements have been made whereby he can continue as Director as well as hold his academic position. The benefits from such a combination are obvious and I need not go into detail here. However, I want to point to one very important thing which it does do, namely to the opportunity offered of utilizing the facilities of the Institute in the training of young people to carry on with this important phase of pharmaceutical education. Graduate study in these non-technical areas will be instigated and we hope that without too much delay a sufficient number of specialists will be at the disposal of the profession.

I take pride in stating that this newly created chair for the History of Pharmacy represents the first full professorship in the field at an accredited university in the whole world. The United States was the first country in which, by the creation of the Section on Historical Pharmacy of the American Pharmaceutical Association in 1904, recognition was given to the responsibility of organized pharmacy for the cultivation of its history and tradition. It again takes the lead in giving full academic recognition to the value and standing of pharmaceutical historical research and teaching within the frame of the history of science and the professions at large.

It will hardly surprise you when I state that in this very important event too, it was the generosity of Mr. A. J. Horlick which helped to overcome the financial problems involved.

The Joint Sessions of the A.Ph.A. Section on Historical Pharmacy and the A.I.H.P.

It is the feeling of the officers of the A.I.H.P. that the joint sessions of the A.Ph.A. Section on Historical Pharmacy

and the A.I.H.P. have been very successful indeed. It is our hope that this cooperation will become a regular feature to the benefit of historical research in pharmacy and its distribution.

In closing, I want to extend thanks to those of you who have joined with us in the joint sessions as well as in this business meeting.

Report of the Director of the American Institute
of the History of Pharmacy for the time from

September 1, 1946 to August 31, 1947.

GEORGE URDANG

Pharmacy's Part In Society

The outstanding feature in the work of the Institute during the period covered by this report was the publication and distribution of the book entitled *Pharmacy's Part In Society*. In the letter accompanying the copies sent to journals for review the following thought was expressed:

"The title '*Pharmacy's Part In Society*' states exactly what the book is intended to be, a historical account rather than a history. The idea has been to give evidence, properly arranged and well documented, of what pharmacy's place and part has been through the ages, and of the tasks which the profession has met and will always have to meet for the sake of society."

The response has been greatly satisfying within pharmacy and without. The following quotation from a review published in *The Merck Report*, vol. 56, 1947 (No. 1, January) expresses most concisely what has been said in a similar way in a number of reviews:

"Logical assertions proved by definite facts are presented to elevate pharmacy to its rightful position among the professions. History from the thirteenth century to the atom bomb is shown to be conclusive to ensure the part of pharmacy in society regardless of change."

In order to assure the beneficiary results expected from this contribution, copies of the first DeLuxe edition were sent not only to the members of the A.I.H.P. but to the Libraries of all Schools (Colleges) of Pharmacy in the United States and Canada and to a number of prominent people in the sciences and professions. There has been furthermore some sale of copies proving the interest awakened by the many favorable reviews.

How much this book, and the work of the American Institute of the History of Pharmacy on the whole, have been meeting urgent needs is illustrated by the following quotation from a letter of an executive in one of our leading pharmaceutical manufacturing plants:

"One incident I have been wanting to relate to you is in connection with the History of the American Chemical Industry which is under preparation. A preliminary draft of a chapter for this work was submitted for review. It seemed to slight pharmacy somewhat, so I submitted comments on this as well as other phases of the work which in my opinion needed attention. In this connection I took advantage of the opportunity to direct the author's attention to 'Pharmacy's Part in Society' and especially to Chapter 3 'Pharmacy as the Mother of Scientific Chemistry.'

"I cite this incident merely to show that I was quick to take advantage of the educational value of your scholarly work in bringing it before a historian who apparently was not familiar with the rich historical background of pharmacy in the evolution and development of science in its own and related professions."

Books like an industry sponsored History of American Chemical Industry are of greatest influence for an almost unlimited period of time. Their authenticity is taken for granted and what is said and not said in such a book, its statements as well as its omissions, are bound to mould public opinion and to be referred to again and again. If

the endeavor of our friend quoted above has been successfully supported by the material offered by the American Institute of the History of Pharmacy in "Pharmacy's Part In Society", this publication has come just in time.

On the instigation of Dr. E. L. Newcomb in his capacity as Secretary of the American Foundation for Pharmaceutical Education a paper bound reprint of 5000 copies was prepared. Copies were sent by the "Foundation" to all high schools with libraries in order to be placed at the disposal of high school students requesting literature on pharmacy as a career and to a number of other institutions.

As already stated in the report for 1945/46, the undersigned is indebted to Dr. Newcomb furthermore for proof reading and quite a number of helpful suggestions, and to Dr. Fischelis, Secretary of the American Pharmaceutical Association, who read the first draft and wrote the foreword.

We consider it our very welcome duty to list here, with our sincere thanks, the names of the donors whose contributions made the DeLuxe edition of "Pharmacy's Part in Society" possible. They are in alphabetical order:

W. N. Creasy (Burroughs, Wellecome & Co.), H. A. B. Dunning (Hynson, Westcott and Dunning), Frederick H. Leonhardt (Fritzsche Brothers, Inc.), A. W. Lescohier (Parke, Davis and Co.), Eli Lilly (Eli Lilly and Co.), George W. Merck (Merck and Co.), Edwin L. Newcomb (National Wholesale Druggists' Association), Carleton H. Palmer (E. R. Squibb and Sons), S. B. Penick, Sr. (S. B. Penick and Co.), Gustavus A. Pfeiffer (William R. Warner and Co.), Edward S. Rogers (Sterling Drug, Inc.).

Other Contributions to the Members of the A. I. H. P.

A report of the Director for the time from September 1, 1945 to August 31, 1946, and of the meetings held at Pittsburgh, Pa., on August 28 and 29, 1946. Reprinted from *Am. Journ. Pharm. Educ.*, vol. 10, 1946 (No. 4, October);

A pamphlet entitled "The First Five Years of the American Institute of the History of Pharmacy."

The Serpents in Medicine. Reprinted from *The Wisconsin Druggist*, vol. 15, 1947 (No. 1, January);

A mimeographed report on the annual meeting held at Madison, Wis., on April 3, 1947;

The American Institute of the History of Pharmacy and the A.Ph.A. Section on Historical Pharmacy. Paper presented before the joint session of the A.Ph.A. Section and the A.I.H.P. on August 29, 1946 by Arthur H. Uhl. Reprinted from *Am. Journ. Pharm. Educ.* vol. 11, 1947 (No. 1, January);

The Interrelationship of Pharmacy and Medicine. By James C. H. Russell. Reprinted from *Am. Journ. Pharm. Educ.*, vol. 10, 1946 (No. 3, July).

Articles of the Director Not Listed Above

Modern Pharmacy. *Modern Pharmacy*, vol. 31, 1946 (No. 3, September);

Scheele, The Apothecary, as a Biochemist. *The Biologist*, vol. 29, 1946 (Nos. 1 and 2, December);

History of District No. 4 of Boards and Colleges of Pharmacy. *Am. Journ. Pharm. Educ.*, vol. 11, 1947 (No. 2, April);

Pharmacy in Colonial North America. *The Merck Report*, vol. 56, 1947 (No. 2, April);

Pharmacy in the United States Prior to the Civil War. *The Merck Report*, vol. 56, 1947 (No. 3, July).

The Pharmaceutical Survey

The American Institute of the History of Pharmacy has been assigned the task to furnish a historical introduction to THE PHARMACEUTICAL SURVEY to which Dr. Edward C. Elliott with a number of associates, and supported by American Pharmacy in all its branches, are devoting their talents, experience and energy. We have taken pride in fulfilling this task to the best of our ability and as quickly as possible. The "Pharmaceutical Survey Current" of December 1946, published in *Am. Journ. Pharm. Educ.*, vol. 11, 1947 (No. 1, January) p. 193, reports the following:

"Dr. George Urdang, Director of the American Institute of the History of Pharmacy, has completed his chapter on the historical background and origins of American Pharmacy. This contains significant material for an understanding of the nature of many of the present day problems of the profession."

The chapter has been given the title *The Way of American Pharmacy to its Present Stage* by Dr. Elliott and his collaborators. The offer of an honorarium for the author of the chapter has been refused since it is just this kind of service which, in the opinion of the officers and sponsors of the American Institute of the History of Pharmacy, forms an integral part of the objectives for the pursuit of which the Institute was founded and has been conducted throughout the time of its existence. It is for these services in general, not for the one or the other of them, that the Institute thinks itself entitled to ask for its recognition and support by American Pharmacy on the whole.

Pictorial History of Pharmacy

In continuing the publication of "historical pages" in the *American Professional Pharmacist*, pictures and explanatory notes concerning the following topics have appeared:

<i>Topics</i>	<i>Issues of the A. Pr. Ph.</i>
Late Seventeenth Century Hungarian Pharmacy.....	vol. 12, No. 8, 1946
Late Seventeenth Century German Pharmacy.....	vol. 12, No. 9, 1946
Inspection of a Seventeenth Century Pharmacy ...	vol. 12, No. 10, 1945
Inspection of an Eighteenth Century Pharmacy...	vol. 12, No. 11, 1946
A Seventeenth Century French Pharmacy.....	vol. 12, No. 12, 1946
Frans van Mieris' The Apothecary.....	vol. 13, No. 1, 1947
Allegoric Seventeenth Century Pharmacy.....	vol. 13, No. 2, 1947
Ignatius of Loyola in a Jesuit Cloister Pharmacy..	vol. 13, No. 3, 1947
Seventeenth Century Pharmacy Facade.....	vol. 13, No. 4, 1947
Italian Pharmacy about 1700.....	vol. 13, No. 5, 1947
Italian Eighteenth Century Pharmacy.....	vol. 13, No. 6, 1947

Addresses, etc.

Among the addresses, *etc.*, delivered by the Director of the A.I.H.P. two may be mentioned:

1. One World in Pharmacy. Address on the occasion of the national meeting of Kappa Epsilon at Madison, Wis., April 19, 1947;
2. The Specifics in Therapy. Lecture presented to medical students within the frame of the course in the History of Medicine given by Dr. Edwin H. Ackerknecht, Professor of the History of Medicine at the Medical School of the University of Wisconsin.

"Chymia"

The University of Pennsylvania Press will initiate shortly "a new international publication", an annual in the history of chemistry, entitled "*Chymia*," which is sponsored by the Edgar F. Smith Memorial Collection at the University of Pennsylvania. This publication, the first of its kind in the United States, will be, as the announcement of the publisher puts it, "under the direction of a board of American editors, with a large group of consulting editors of international prominence."

The Director of the A.I.H.P. has been offered and has accepted the appointment as one of the American members of the Board of Consulting Editors (as yet eight) of "*Chymia*" with the special task of paying particular attention to the history of pharmaceutical chemistry.

Book Reviews and Bibliographies

During the time covered by this report book reviews or annotations by the Director of the A.I.H.P. were published in the *Journal of the Am. Pharm. Assoc., Sc. Ed.*, in the *Bull. of the Hist. of Medicine*, in the *Wisconsin Druggist* and in the *United States Quarterly Book List*.

In his capacity as a member of the Committee compiling the annual *Bibliography of the History of Medicine in the United States and Canada*, published in the *Bull. Hist. Medicine*, the Director of the A.I.H.P. has for the 1946 issue again contributed the list of publications pertaining to pharmacy.

Correspondence

The Institution has been increasingly taken advantage of as a source of information by American pharmacists in the retail, wholesale and manufacturing industry, as well as by people outside of the profession working on or interested in historical problems touching pharmacy or related fields. The interchange started after the war of news, publications, and information between the A.I.H.P. and interested people abroad has become somewhat more regular.

Future Plans

It is intended to revive the *Seminars for Teachers of the History of Pharmacy* with the next one (third) to be held in the summer of 1948 at Madison, Wisconsin.

The following projects, mentioned in last year's report as being started, are still to be continued:

1. A book, to be entitled "*Martin Heinrich Klaproth, the Pharmacist Who Discovered Uranium*";
2. A bibliography of Dr. Edward Kremers, to be entitled "*Edward Kremers, Educator of and in American Pharmacy*";
3. The collection of material for a *History of Pharmaceutical Education in the United States*.

The plan of an *English Language History of Pharmacognosy*, actively approached by Dr. J. Hampton Hoch, and of a *History of Military Pharmacy in the United States* which Dr. Ralph Bienfang has made his task, will be given continued attention and, as far as possible, assistance.

New tasks will be welcomed and approached as they arise and prove worthy of attention.

The undersigned thinks it adequate to conclude this report like the previous ones with the following statement as to the objectives of the Institute:

The aim of the American Institute of the History of Pharmacy is to equip the pharmacist for citizenship in the world of intellectual and moral responsibility by making him familiar with the non technical aspects and humanistic ramifications of the profession, and to do pharmacy's share in the cooperative endeavor for making the historical record of world civilization as complete as possible.

Qualifying for the Course in Dispensing*

HOWARD C. NEWTON

Massachusetts College of Pharmacy

Dispensing is the culmination of the pharmaceutical curriculum. You have heard this statement many times in these meetings. We who are teachers of pharmacy realize the importance of having the administrative office as well as the other departments of the college recognize that dispensing is the culmination of the curriculum and, as stated by Professor Ohmart last year, that it is "the course toward which all the other courses of the curriculum are oriented, since it is here and only here that the student has the opportunity to apply the knowledge gained in these courses to the professional activities for which he is preparing."

The quality of the course in dispensing in a college is, we believe, a fairly good criterion of the quality of its more recent graduates as pharmacists. From the viewpoint of the administrative office as well as of the teachers of pharmacy, the course is one to which we may wisely devote considerable attention in these meetings.

Others have or will have discussed the content of the course in dispensing, so it is not our purpose to enter into that phase of the subject at this time. Rather, we intend briefly to draw attention to two points that we believe may contribute to progress toward our objective, the general

*Read before the Conference of Teachers of Pharmacy at the 1947 meeting at Milwaukee.

recognition of the course as an outstanding culmination of the curriculum. These points deal with (1) the essential qualifications for admission of students to the course, or in other words its prerequisites, and (2) an aid in correlating the course with the other courses of the curriculum so that it may justify its position. They may be briefly and simply stated.

First, we believe that in order to qualify for admission to the course in dispensing a student should have completed satisfactorily all the courses of the first three years of the curriculum and have satisfactorily completed or be concurrently taking all the other required courses of the senior year. This ensures that every student in the course may draw on the knowledge and skill gained in each of the other required courses of the curriculum. It ensures that no matter how much acceleration, intensification, or irregular arrangement has occurred among other courses this course will remain as one that is not subject to inclusion in irregular programs based on temporary expediency. It thereby becomes the prestige course of the curriculum in the minds of the faculty, the administrative office, and the students.

With the many irregular students having a great variety of previous education who are now entering our colleges of pharmacy it is necessary more than ever before to establish these prerequisite qualifications if the prestige of this course and of the pharmacy curriculum is to be maintained.

We believe that a student should be preparing to qualify both generally and specifically for the course in dispensing from the beginning of his freshman year. The general preparation is evident in the non-professional courses, but how to gain specific preparation in other than the pharmacy courses may not be apparent. Our second point deals with a plan for accomplishing this desired correlation in the curriculum.

The plan is not complicated. If the instructors in the course in dispensing will very carefully note and record any

subject matter on which a considerable number of the class are not informed and with which they should be familiar if they are to dispense medicines intelligently and well, we then have the basis of our plan. With these records at hand at the end of a term, semester, or session, the subject matter in which the class seemed deficient is separated into groups according to the course in which each division of it was presumably presented. It is then distributed among the directors of the respective courses. They, in turn, will note the findings and will give additional emphasis to the subjects at their next opportunity.

To illustrate the plan, we shall assume that in the course in dispensing we find that several of the students are not sufficiently familiar with the physical properties of salol. This is noted and brought to the attention of the director of the course in organic chemistry. Or, if the students demonstrate a lack of knowledge of the significant difference between Ceylon Cinnamon Oil and Cinnamon Oil, this is called to the attention of the director of the courses in pharmacognosy. And, if the deficiencies are in the form of the misspelling or the misuse of certain words in a report, this is made known to the director of the English courses. A confusion in the interpreting of nomenclature of inorganic chemicals is referred to the director of the course in inorganic chemistry, and so on.

We know what you are thinking about this plan. You are sure that it will cause resentment on the part of the directors of the other courses. This may easily be the result, but it does not need to be. A little diplomacy will aid in developing a real spirit of cooperation among them. Experience has demonstrated that this desirable result can be accomplished.

Very briefly we have presented two points that we think are valuable in maintaining the course in dispensing at a very high level of efficiency and, thereby, establishing it more firmly as the true culmination of the curriculum.

Laboratory Material for the Course in Dispensing*

Mitchell J. Stoklosa

Massachusetts College of Pharmacy

The objectives of the course in dispensing pharmacy are (1) to apply the knowledge and skill acquired in all the other courses which comprise the pharmaceutical curriculum, (2) to familiarize the student with the many specific operations and facts connected with this phase of pharmaceutical practice and (3) to develop the technical skill which is so essential for success in it. These aims form a sound basis for the proper selection of the material which is to be used in the didactic and laboratory phases of the course.

To realize these objectives, a substantial portion of the time allotted for dispensing should be devoted to an intensive study of physicians' prescriptions. The didactic work which forms an integral part of the course should not be underestimated since many didactic hours are devoted, in a properly organized course, to a discussion of prescriptions. Particular emphasis, however, must be placed on the laboratory work. Because of the very fact that this phase of instruction has all the functions of an internship, it becomes the means by which the student acquires the professional experience so necessary in the training of safe and competent pharmacists.

In view of the important function of the laboratory work in dispensing, it is imperative that teachers bear in mind certain factors regarding the proper selection of laboratory material for the course. Any attempt to achieve the objectives stated above by selecting as laboratory material textbook prescriptions, routine problem types, or a stereotyped set of prescriptions, the set numbering a hundred or so, will result in failure. Such assignments do not afford the experience

*Read before the Conference of Teachers of Pharmacy at the 1947 meeting at Milwaukee.

which the dispensing course is intended to provide. Rather, the work will, of necessity, be repetitious; it will probably lack the proper motivation and it will not create the interest so necessary for student cooperation.

To provide the practical experience whereby the student is afforded an opportunity of applying the fundamental training acquired in all the other courses, the material chosen for the laboratory instruction must be varied in character. It must be of such a nature that it will offer a chance for the compounding and dispensing of all the recognized types and classes of preparations. The prescriptions should be selected from active files of retail stores, professional pharmacies, and hospital pharmacies whose nature and geographic location vary widely. The laboratory work should include problems that involve situations simulating those that the student might be expected to encounter in actual practice. More specifically, some of the assignments might well necessitate the weighing or measuring of small quantities of substances, potent in character, by means of the aliquot method so that the student will acquire the proper technique of obtaining accurately amounts that cannot be weighed or measured within a permissible margin of error by means of equipment that will not permit direct measurement within allowable tolerances. Accuracy, neatness, and cleanliness must be stressed in the laboratory work. An opportunity should be provided for the compounding of prescriptions involving incompatibilities, for the preparation of adjusted solutions, and for the dispensing of narcotics and exempt narcotics. Because of the ever-increasing number of prescriptions for proprietaries, the student must be required to familiarize himself thoroughly with those prescription specialties which are commonly prescribed by physicians. Aside from the actual compounding and dispensing of prescriptions, the laboratory work should include the filling of orders for ampuls, biologicals, bacteriological stains and diagnostic reagents, drug sundries and sick room supplies. Finally, the material must be kept up-to-date; new prescriptions should be added and old ones discarded in accordance with the demands of current practice.

From the teacher's point of view, the laboratory material must be well organized, properly classified, and so arranged that it may be assigned in the laboratory in a most efficient manner. Some sort of a record sheet must be devised so that the teacher will have, at all times, an accurate picture of the assignments given, the progress of the student, and the nature of the work which is yet to be assigned to him.

Ever mindful of the objectives stated in the beginning and conscious of the need for the type of laboratory material described above, the pharmacy department in the college formulated a scheme for the selection, classification, and assignment of laboratory material for the course in dispensing. The plan has been in successful operation at the college for several years and is presented as a part of this paper with the hope that it may serve a useful purpose in helping those who may be faced with the problem of organizing such material.

The material was selected by members of the pharmacy department after reviewing scores of prescription files of stores and hospital within a relatively wide geographic area. Over 500,000 prescriptions were examined. To provide the necessary variety of work and to insure that each student in an average class of 50 would have an opportunity of dispensing all of the recognized types with little chance for repetition, approximately 5,000 prescriptions were selected and copied. These were classified according to type or according to the unusual principles and teaching points exemplified in them. Each prescription was labelled with a letter or combination of letters to denote the class or type to which it belonged, and with a number to denote its numerical sequence in that particular group. The prescriptions were placed in a master file in alphabetical order. Copies of these are made at the beginning of the school year preparatory to the laboratory sessions. The file is revised at frequent intervals in order that it may be kept up-to-date. Old prescriptions and those which experience has proven unsatisfactory from a teaching point of view are deleted and new ones added.

A laboratory sheet was devised for the purpose of keeping records. At the beginning of the school session, each student is assigned a record sheet which bears his name and which serves as a ready reference of his progress during the year. The sheet contains the classification according to which the prescriptions in the master file have been arranged. When the teacher in charge assigns a prescription to a student, he designates its number next to the proper letter or combination of letters which appear in the several columns on the sheet. After the prescription has been compounded and dispensed in the laboratory, it is graded and, if satisfactory, checked off as completed in the column next to the proper number.

The prescriptions for assignment during a laboratory period are selected beforehand. This procedure affords an opportunity for a careful selection of work based on an examination of student record sheets and provides a means for distributing the prescriptions without undue delay when the laboratory session begins. The student is given one, two, or three prescriptions at a time, thus simulating the manner in which they may be presented to him in the retail pharmacy.

Perhaps the most important advantage of the plan for assigning the work is the remarkable flexibility of the scheme. More specifically, a given group of students would not be compounding representative types of only one class of preparations during a laboratory period; that is, they would not be preparing capsules one week, ointments or suppositories the next, and emulsions the week after. Rather, a group composed of ten students, for instance, may be compounding prescriptions for ten different classes or types during one laboratory session, this situation representing, of course, what may actually take place in the prescription department of a professional store. Further evidence of the flexibility of the plan is evidenced by the fact that assignments may be varied as to their complexity or difficulty in accordance with the progress of the student.

Aside from the actual filling of prescriptions for proprietaries, the student is required to consult the literature files about the nature of the proprietary, its composition, therapeutic uses, dosage, methods of administration, and cost. At the recitation which follows the laboratory session, he must be prepared to answer questions concerning the prescription specialty that appear on a sheet formulated especially for this purpose.

That each student may become thoroughly familiar with the work done by the other members of the class, all of the prescriptions which are filled in the laboratory are posted on a bulletin board after they are dispensed. Written recitations are based largely on the prescriptions which have been posted for study.

A key to the classification with typical prescriptions, a copy of the laboratory record sheet, and a copy of the sheet which is used for data on prescription specialties form a part of this paper. Although no specific reference is made to such points as the interpretation of prescriptions, the checking of doses, and the handling of equipment in the key to the classification, it is understood, nevertheless, that particular emphasis is placed on them throughout the laboratory work. The student is expected to detect overdoses, to interpret certain ambiguities and to fulfill, at all times, the intent of the physician. In the case of prescriptions about which the prescriber must be consulted, the student must confer with the teacher in charge in the same manner as he would have to consult the physician in actual practice.

Teaching results seem to indicate that the scheme outlined above for the selection, classification, and assignment of the laboratory material for the course in dispensing is a very satisfactory one. The method of choosing the prescriptions affords the wide variety of material so essential for supplying the professional experience which colleges of pharmacy must provide. The classification of the material is simple, yet well organized. The laboratory record sheet fur-

nishes a ready reference of assignments and student progress. The administration of laboratory work based on the type of material described in this paper to small groups of students, under the close supervision of teachers in charge of the course, constitutes an effective teaching tool in summarizing the information gained in all the other courses and in forming a connecting link between theory and practice.

KEY TO CLASSIFICATION

<i>Letter or Letters</i>	<i>Minimum Number of Prescriptions Assigned to Each Student</i>	<i>Class or Type of Preparation</i>	<i>Points of Emphasis In Instruction and In Grading</i>
AB	1		Measuring small amounts (aliquot method)
AC	2		Weighing small amounts (aliquot method)
ADB	1	Capsules	Accuracy
ADC	1	Divided powders	Accuracy
AF	2	Solutions	Accuracy (ratio, dilution, etc.)
BA	2	Liquids, ointments, etc.	Cleanliness (handling of dyes)
BB	2	Liquids, ointments, etc.	Cleanliness (handling of viscous liquids)
BC	2	Liquids, ointments, etc.	Cleanliness (handling of fats and oils)
CA	2	Ointments	Simple incorporation
CB	4	Ointments	Levigation
CD	1	Ointments	Fusion and emulsion
CE	1	Ointments	Solution
CG	1	Ophthalmic ointments	Technique (tubing, etc.)
DA	2	Divided powders	Technique
E	2	Bulk powders	Technique
FA	2	Capsules	Technique (cleanliness)
FC	1	Capsules, sealed (liquid)	Technique (cleanliness)
FD	1	Capsules, coated	Technique (cleanliness)

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FE	1	Capsules, soft mass	Technique (cleanliness)
HA	1	Pills	Technique
I	1	Tablet triturates	Technique
IS	4	Adjusted solutions	Calculation
JA	1	Emulsions, O/W	Technique
JB	1	Emulsions, W/O (liniments, ointments, creams)	Technique
KA	1	Suppositories by hand	Technique
KB	1	Suppositories by fusion	Technique
KC	1	Suppositories by compression	Technique
KD	1	Suppositories, glycero- gelatin base	Technique
L	1	Konseals	Technique
M	1	Collodions	Technique
N	1	Infusions	Technique
OA	4	Collyria	Technique (clarity)
OB	1	Percentage solutions	Accuracy (calculation)
P	6	Solutions, chiefly for oral use	Technique
R	6	Liquids containing in- soluble material	Technique (use of pharmaceutical adjuncts)
S	2	Stains and reagents	Cleanliness and accuracy
T	2		Telephone orders
VA	2	Incompatibility, physical	Remedy
VB	1	Incompatibility, chemical	Remedy
WA	2	Narcotic	Method of handling
WB	2	Exempt narcotic	Method of handling
XA			
to	25	Proprietaries	
XO			
Y	3	Orders for ampuls, biologicals and sundries	
SP	6	Special items, un- classified	

AC-75

**MASSACHUSETTS
COLLEGE OF PHARMACY
BOSTON**

Name..... Date.....

Address

B

Atropine Sulf. gr. $\frac{1}{1000}$ } per
 Codeine Sulf. gr. $\frac{1}{8}$ } drop
 Make $\frac{1}{2}$ oz. of this solution so that
 each drop will contain the above.
 Sig. One drop as dir.
 Sig. Sop on face.

R-100

**MASSACHUSETTS
COLLEGE OF PHARMACY
BOSTON**

Name..... Date.....

Address

R

Sulf. ppt.	10.
Spt. Camphor	10.
Alcohol	60.
Rose water ad	240.

XO-200

**MASSACHUSETTS
COLLEGE OF PHARMACY
BOSTON**

Name..... Date.....

Address

B

Cap.
 Vit. B. Complex
 Disp. no. C
 Sig. One t. i. d.

**MASSACHUSETTS
COLLEGE OF PHARMACY
BOSTON**

Name..... Date.....

Address

R

Coal tar	2.0
Zinc Oxide	2.0
Starch	5.0
Petrolatum	30.0

Sig. Ext. use.

White M. D.

Smith M. D.

Reg. No.

Reg. No.

PHARMACY 404
DISPENSING LABORATORY

NAME

B	No.	B	No.	B	No.	B	No.	Manufacturing
AB		FC		P		XD		
AC		FD		P		XE		
AC		FE		R		XE		
ADB		HA		R		XF		
ADC		I		R		XF		
AF		IS		R		XG		
AF		IS		R		XH		
BA		IS		R		XI		
BA		IS		S		XJ		
BB		JA		S		XK		
BC		JB		T		XL		
BC		KA		T		XO		
CA		KB		VA		XO		
CA		KC		VA		XO		
CB		KD		VB		XO		
CB		L		WA		XO		
CB		M		WA		XO		
CB		N		WB		Y		
CD		OA		WB		Y		
CE		OA		XA		Y		
CG		OA		XA		SP		
DA		OA		XA		SP		
DA		OB		XB		SP		
E		P		XB		SP		
E		P		XC		SP		
FA		P		XC		SP		
FA		P		XD		SP		

PHARMACY 404

Name of Product

Name of Student

1. Name of manufacturer
2. Nature of product (tablet, capsule, solution, etc.)
 - 2a. How supplied
3. Composition of product (principal constituent or constituents)
4. Therapeutic use or uses
5. Advantages claimed
6. Recommended dosage
7. Usual mode or modes of administration
8. Approximate cost (indicate whether the price quoted is list or net)

A Survey of the Development of Materia Medica in American Schools and Colleges of Pharmacy from 1821 to 1900

J. HAMPTON HOCH

School of Pharmacy, Medical College of the State of South Carolina

Discussion of the topic of *materia medica* and its teaching over a span of seventy-nine years will be simplified by dividing this presentation into two parts. I have selected 1876 as a dividing time because a new influence on pharmaceutical education then became implicit with the establishment at the University of Michigan of an independent Department of Pharmacy. Also, 1876 was the mid-point in the functioning life of the first association of our colleges, the Conference of Colleges of Pharmacy,¹ organized "to promote the interests of pharmaceutical education".

The fundamental divisions adopted by the curriculum builders in our profession have been pharmacy, *materia medica*, and chemistry. While there has always been some overlapping between these "core" subjects, they were firmly implanted in our educational institutions from the start. Before Samuel Jackson, M. D., Professor of *Materia Medica* and Pharmacy at the Philadelphia College of Pharmacy, gave his first lecture in 1821, there had been other physicians in Philadelphia who held the same dual chair. True, S. P. Griffits and J. R. Coxe taught at the Medical School of the University of Pennsylvania, but when the field of instruction for the pharmacist was organized it followed the pattern already set in the medical college.²

¹ Established in 1870; inactive after 1883. E. Kremers, *Drug. Circ.* 51:61 (1907).

² "The medical schools in different sections of the country early recognized the necessity of including instruction in pharmacy in their regular curriculum, and a number of them included pharmacy in the title of one of their professors. In 1820 no less than six of the medical schools enumerated by Thatcher in his 'History of Medicine in America' included more or less extensive instruction in pharmacy. The chair of 'pharmacy' was usually combined with that of chemistry or *materia medica* . . ."—M. I. Wilbert, *A. J. Pharm.* 79:406 (1907).

Which brings us to a consideration of what was meant by *materia medica*. As a general term it embraced everything relating to remedies used in the treatment or prevention of disease. But pharmacy as the science and art of preparing, combining and dispensing these remedies had emerged from under this comprehensive designation as a separate study. However, pharmacognosy, pharmacology or pharmacodynamics, and therapeutics were still included under the term *materia medica* and had to await a later "division of labor" before they likewise became established as separate studies. Aspects of botany and physiology and toxicology were also included in *materia medica* courses until separate courses for these sciences were subsequently established in the curriculum.

Prior to the organization of the American Pharmaceutical Association in 1852 for "the advancement of pharmaceutical knowledge" only three associations (colleges) of pharmacists had exercised systematic teaching functions: Philadelphia since 1821, New York since 1829, Maryland from 1841 to 1847.

The separation of pharmacy as a department distinct from *materia medica* and taught by a pharmacist rather than by a physician was first adopted by the Philadelphia College in 1846 when William Proctor Jr. was elected Professor of Pharmacy. The chair of *materia medica* at P.C.P. however continued to be filled by physicians until 1864 when Edward Parrish, another graduate in pharmacy, became Professor of *Materia Medica*.³ Parrish held this professorship for three years when he exchanged chairs with J. M. Maisch.

Before discussing the significance of Professor Parrish's appointment let us examine the kind of instruction in *materia medica* which had prevailed in the colleges then functioning as teaching institutions. The lectures in *materia medica* were given at night, two or three times a week, for varying periods up to about twenty weeks. No laboratory work was included.

³ W. B. Canavan was a Ph.G. (1848) who a decade earlier (1834-1853) was for a short time Professor of *Materia Medica and Pharmacy* at the New York College of Pharmacy.

The professors were only engaged part time at the colleges of pharmacy, being engaged in medical practice and teaching at medical schools the rest of the time. They supplemented their didactic instruction with pictures and charts and we are told that Dr. G. B. Wood (1831) brought living plants to class to illustrate his lectures. Then too the colleges accumulated "cabinets" of crude drug specimens which were the nuclei of their later museums. Herbarium material was gradually acquired, often by gift or bequest, and in this way materials were gathered for illustrating the lectures.

Botanical instruction was at first included in the didactic work in *materia medica*. By 1849 the New York College had established separate lectures in botany and *materia medica*, three hours per week for two months in each, although optional summer lectures in botany had been given at an earlier date (1843); and in 1850 the lecture course in botany was made a requirement for the diploma at New York. Although the use of the microscope for detecting adulterations was urged, particularly after the enactment of the drug import law of 1848, it remained for many years more of an exhibit than a tool in the teaching of pharmacy students.

The initial organization of the faculty of the Chicago College of Pharmacy in 1859 placed Dr. J. H. Rauch in the chair of *Materia Medica and Medical Botany* and thus accorded to botany a certain recognition which the New York College alone had previously acknowledged. With the designation of Maisch (at P.C.P. in 1867), Tracy (at Massachusetts in 1867), Day (at New York in 1870), Wayne (at Cincinnati in 1872), and Scheffer (at Louisville in 1872) as holders of the dual chair of *Materia Medica and Botany* we find botany becoming more firmly established and recognized as a separate discipline associated with comprehensive *materia medica*. In the St. Louis, Cincinnati, Chicago, and San Francisco colleges the separation was made even sharper by the respective appointments of Wadgymar (1865), Renz (1871), Babcock (1872), and Behr (1873) as professors of a single chair of botany.

The teaching colleges of pharmacy developed from the individual efforts of groups of interested pharmacists and they followed no planned system of education other than those programs used in the established colleges of pharmacy or in medical schools. Such spontaneous and unrestricted development of teaching agencies, whose primary objective was to supplement the apprentices' store training, was unlikely to assure thorough training in the fundamental sciences.

The desired freedom from medical "domination" envisaged by the founders of our early colleges of pharmacy was not complete as long as the only well qualified teachers to be employed were physicians. But with the designation of the pharmacists Canavan (1854), Parrish (1864), Maisch (1867), and Hambright (1870)⁴ as professors in the field of *materia medica*, which heretofore had been the special domain of medical men, a new spirit of independence and coming of age was manifested.

Objections to non-medical men teaching *materia medica* were summarized⁵ as: "first, therapeutics and toxicology are less dwelt upon than formerly—more time being devoted to the leading physical characteristics of each drug and its commercial history; secondly, it (course in *materia medica*) is therefore less a preparatory school for medical students; thirdly, it is no longer a training school to supply professors to our medical institutions." Professor Maisch replied to the first criticism, defending the scope of *materia medica* as he then taught it by saying: "Whatever views may be held, regarding the necessity for the apothecary, of a thorough knowledge of the physiological action of medicines upon man and animals, it must be certainly granted that a knowledge of the botanical, physical, histological, chemical and commercial relations and of the proper doses of drugs, is of far greater importance to the apothecary and druggist. Outside of the United States physicians are only in exceptional cases appointed as teachers of pharmacognosy, as they cannot be

⁴ At the Chicago College.
⁵ A. J. Pharm. 47:236 (1875).

conversant with drugs unless they have made these their special study for years." Colleges of pharmacy were not established for the purposes voiced in the last two objections.

This growing up was a growing away from the dominant influence of the medical viewpoint and it permitted the development of a kind of *materia medica* which placed more emphasis on pharmacognosy and less on therapeutics.

A particularly significant event was the introduction of a pharmaceutical curriculum in the University of Michigan in 1868 and the later establishment in 1876 of its school of pharmacy, whereby university methods and standards became a leaven in the body of pharmaceutical education. However, the influence of this institution and others like it on the development of *materia medica* falls into our second era.

As we come to the close of the first period of instruction, microscopy makes its entry into the curriculum as microscopic botany, appearing as an optional course at Michigan in 1875 but required after 1876. M. W. Harrington, Assistant Professor of Botany at Michigan, issued his pamphlet on "Identification and Microscopic Examination of Crude Drugs and other Vegetable Products" which was a skeleton text of a system of *materia medica* based on organological, physical and structural qualities of the drugs rather than an arrangement according to botanical origin or alphabetical sequence. Most of the English and American texts on medical botany and *materia medica* then extant (1876) followed either a botanical or alphabetical classification. A few of them designated particularly for medical students, were arranged on therapeutical or physiological lines.

The use of botanical models as teaching aids to supplement charts and drawings was not neglected. The Philadelphia College imported sixty-five structural models in 1875 for illustrating lectures on botany and *materia medica*. Likewise the stereopticon was utilized, at least at New York and Philadelphia (1874-5), to illustrate lectures. Dr. F. Hoffman

delivered a lecture on the application of the microscope in pharmacy before a conversational meeting of the New York College, February 12, 1874, and illustrated sections of many drugs by the aid of the oxy-hydrogen stereopticon.

Another point pertinent to this first period—teaching of toxicology began to achieve greater prominence with the offering of laboratory work at Michigan in 1869, of optional lectures on the subject at the Maryland College in 1871, and the designation, at Chicago, of D. B. Trimble as Professor of *Materia Medica and Toxicology* in 1872. The same year saw the Philadelphia College also instituting optional lectures on toxicology. Thus we find another phase of the study general *materia medica* becoming segregated for special consideration.

The instruction of this era has been described as follows: "The idea was not so much to give a thorough training in the fundamental sciences as to supplement the unsystematic training of the stores by a course of evening lectures . . . the clerk who had served an apprenticeship of two or more years attended the same course of evening lectures twice. . . . The course of lectures simply served as a kind of superstructure, their prime object being to bring into some system the information and experience irregularly acquired during an apprenticeship and assistantship of four or more years."⁶

In the domain of *materia medica* didactic systematizing had in general progressed to the point where some botanical instruction preceded the main course, where optional botany excursions into the fields and parks would no longer suffice, and where the microscope would become a tool in required laboratory work. Emphasis was shifting from therapeutics to pharmacognosy, although posology and toxicology also tended to gain in relative importance.

As we pass along to the second period (1876-1900) the first noteworthy development to record is the adoption by

⁶ E. Kremers, Proc. Amer. Conf. Pharm. Faculties, 1903, p. 5.

the colleges of graded courses and the general provision of more time for instruction. The New York College in 1877 adopted graded courses, most of the other colleges following with similar changes in the next few years. A first or elementary course in botany and *materia medica* for the junior students was required before entering on the second or senior course in *materia medica* and pharmacognosy. No longer did a student have to sit through the same lectures a second year. Classes were separated; quizzes were offered as a means of instruction,⁷ and later on laboratory work in botany and microscopy (Chicago, 1883) and in pharmacognosy (New York, 1886) was required, supplanting the optional laboratory courses previously offered.

In the ten year period 1876-1886 several universities joined Michigan in the inauguration of courses or schools of pharmacy.⁸ The use of recitation periods, graded courses and compulsory laboratory work was quite generally employed in university instruction and gradually came to be adopted in all the colleges of pharmacy. The lengthening of the academic year and an increased number of hours of instruction likewise were eventually adopted by the "association" colleges, largely under the stimulus of the university schools. However, the conflict between the educational idealogies of the older colleges and the university schools, especially as to the merits and place of apprenticeship and experience requirements, continued for many years.

The three fundamental divisions of the curriculum remained, but subdivisions into special studies became established as separate courses. In the field of *materia medica* we have noted the separation of botany and the introduction of microscopic botany and microscopy; likewise toxicology had begun to appear as a separate course. Another subdivision of the field was the emergence of courses designated as pharmacognosy, to be followed by courses in physiology and ultimately by bacteriology and pharmacodynamics courses.

⁷ Phila., 1877; N. Y., 1880; Maryland, 1885.

⁸ Vanderbilt 1879, Western Reserve 1882, Wisconsin 1883, Purdue 1884, Ohio Northern 1884, Iowa State 1885, Kansas 1885, Ohio State 1885, Buffalo 1886.

In the first half of the second period (1876-1887) we find that the procurement of microscopical equipment for student use to supplement the demonstration microscopes used in lecture courses made it possible to incorporate real laboratory instruction in microscopy. The New York,⁹ Philadelphia,¹⁰ Chicago,¹¹ Maryland,¹² and St. Louis¹³ colleges all had optional laboratory work in microscopy before the New York College (1886) made the botany laboratory course a prerequisite for entrance to the senior class.

Ten years after introducing optional lectures in toxicology the Maryland College made them obligatory (1881). And at Cincinnati J. F. Judge, M. D. and V. Coblenz, Ph. G. (1884) were designated Professors of *Materia Medica and Toxicology*.

The close liaison between microscopic botany and pharmacognosy led to general appellations such as *materia medica*, microscopy, and pharmacognosy being applied to essentially similar courses in different colleges. The University of Michigan and the New York College were the first to use the title "pharmacognosy" in their chairs.¹⁴

J. M. Maisch at Philadelphia had done much to advance the study of pharmacognosy, especially chemical aspects of the science, although his chair was never designated as pharmacognosy. The "Manual of Organic *Materia Medica*", which he published in 1882, won immediate acceptance as a textbook and for many years subsequent editions were widely used in many of the schools. L. E. Sayre had issued his

⁹ Joseph Schrenk, Professor of Botany incorporated some microscopic botany (1882) in his course. More microscopes were purchased in 1884 at Schrenk's suggestion.

¹⁰ The laboratory of the Alumni Association of P.C.P., established in 1882 under direction of A. H. Brown, Ph.G., gave instruction in examination of urinary sediments as well as the principles of making sections.

¹¹ In the Chicago College (in 1884) microscopes were procured for E. S. Bastin's laboratory in microscopy.

¹² An optional laboratory course in botany and microscopy was started in 1886 at the Maryland College under Dr. D. M. R. Culbreth, Professor of *Materia Medica, Botany and Microscopy*.

¹³ H. M. Whelpley was Professor of Microscopy at the St. Louis College.

¹⁴ E. g. Joseph Schrenk, Professor of Botany at New York initiated instruction in pharmacognosy for the second year students in 1886. He was designated Prof. Botany and Pharmacognosy in 1887, and Prof. Pharmacognosy alone in 1889. When Dr. Rusby succeeded him in 1890, this fourth chair was added to the "sofa" he already occupied—Physiology, Botany, *Materia Medica*, and now Pharmacognosy.

"Conspectus of Organic Materia Medica and Pharmacal Botany" in 1879. Both of these texts were arranged according to Maisch's classification of drugs, an organological scheme based on physical and structural characteristics. The classic "Pharmacographia" of Flueckiger and Hanbury had been published in England in 1874; the "National Dispensatory" of Stillé and Maisch, which emphasized pharmacognostic diagnoses of drugs, appeared in 1879. But both of these books were reference rather than text books.

Kraemer¹⁵ has described conditions in pharmacognosy at this time as very meager with few laboratories where instruction was available; even the little botanical work being done was more or less restricted.

The general situation in most of the twenty-seven colleges functioning in 1887¹⁶ was described by H. L. Taylor:¹⁷ "Three alternative nights a week for twenty weeks a year, the boys and an occasional girl absorbed wisdom, tried out experiments, met tests and went their way, half of them never to return. One-fourth went forth at the close of the second year certified Graduates of Pharmacy."

A Section on Pharmaceutical Education organized in the American Pharmaceutical Association in 1887, served as a forum where facts and opinions were aired and was a valuable adjunct in the struggle to improve instruction and raise standards. The standards for entrance, courses and graduation were sometimes argued quite vehemently; the dangers in the rapid multiplication of colleges were pointed out; methods of teaching were discussed and ideas exchanged.

In speaking of the courses of instruction we have mentioned the names of some faculty members, have referred to the nature of some courses, and have indicated some items of equipment, but the most important factor of all—the quality of instruction—has not been touched upon because

¹⁵ Pharm. Era 45:764 (1912).

¹⁶ Nearly double the number (14) operating in 1875.

¹⁷ Pharm. Era 45:334 (1912).

this intangible, spiritual quality is impossible to capture and discuss.

As we come to the last half of the second period a couple of examples will furnish an idea of some of the courses in the *materia medica* division at this time.

H. H. Rusby planned his course in botany at the New York College (1890) to familiarize the student with the use of descriptive terms, applying these in practical laboratory exercises in structural botany, called junior pharmacognosy. Card mounted specimens were given each student and the proper terms explained.

The second year lecture course, called *materia medica*, included consideration of similarities and differences of drugs following Maisch's classification. The laboratory work, called senior pharmacognosy, stressed identification and evaluation of a reasonable number of specimens with microscopic examination of some of the most interesting.

The lectures of one and a half hours each in botany by D. M. R. Culbreth at the Maryland College were only "incidental for the better conception and description of some of the crude medicinal agents."¹⁸ The few students electing to do practical work divided their time between the field and the laboratory to any extent and in any line desired. *Materia medica* lectures included some discussion of analysis of medicinal plants and organological consideration of drugs, some of them collected in the country by those who elected to botanize. Charts, diagrams and drawings supplemented the permanent display of specimens.

H. M. Whelpley of the St. Louis College advocated (1891) broadening of the microscopy courses, by this time given in nearly all the colleges of pharmacy, to include familiarity with various types of microscopes and accessories, measuring

¹⁸Proc. A.Ph.A. 39:217 (1891).

¹⁹An optional course in Vegetable Histology was added to the curriculum in 1894.

and drawing of objects, as well as preparation, sectioning and mounting.

Mention should be made of the textbooks prepared by E. S. Bastin. While at the Chicago College he issued his "Elements of Botany" (1887) and his "College Botany" (1889). Simultaneously with his initiation of compulsory laboratory work in botany and microscopy at the Philadelphia College in 1894, Bastin published his "Laboratory Exercises in Botany". The excellence of these textbooks was recognized by widespread adoption and they contributed significantly to a broader and deeper foundation in this fundamental science. Bastin's efforts at Chicago, Northwestern and Philadelphia to place pharmaceutical botany on a more scientific basis did much to encourage histological study of crude drugs.

The more advanced status of pharmacognosy in Europe in the last decades of the 19th century came to be reflected in our country through the teachers who received graduate training abroad and returned as proponents of a broader, scientific approach. In 1887, four years after the pharmacy school was organized at the University of Wisconsin, F. B. Power published the "Principles of Pharmacognosy", a translation of Flueckiger and Tschirch's text-book which carried the message of a broad concept of the science.

In discussing the position of *materia medica* in our schools Kremers noted²⁰ that about half of them (17) had combined chairs of Botany and *Materia Medica*, a few (3) still retained Pharmacy combined with *Materia Medica*, and only one had a separate chair of Pharmacognosy although two others combined Pharmacognosy with Botany or *Materia Medica*. Therapeutics, Toxicology and Physiology were also occasionally combined with the chair of *Materia Medica*. Organic and Inorganic Pharmaco-diagnosis were unusual titles used by the Brooklyn College for the chairs held by R. S. Eccles and F. J. Wulling (1892).

²⁰ Proc. A.Ph.A. 40:309-17 (1892).

Oldberg says of the curriculum,²¹ "At least half a dozen schools have teachers of physiology and in many the Professor of *Materia Medica* devotes a small portion of his time to anatomy and physiology and considerable to pharmaco-dynamics. . . . a strong prejudice against pharmaco-dynamics has resulted from the unsatisfactory results of devoting nearly all the time in *materia medica* to the commercial history of drugs and their therapeutic properties and uses, to the serious neglect of pharmacognosy. . . . But this defect in some schools was not remedied wisely. Instead of omitting extended reference to therapeutics while retaining an elementary course in pharmaco-dynamics, the study of pharmaco-dynamics was almost entirely dropped and pure pharmacognosy introduced in its place." The wide variations in facilities and courses among the colleges were summarized by Oldberg:²² "Botany may mean a few lectures on organography, or may include histology, and perhaps also taxonomy, and sometimes it consists largely of biology. *Materia medica* in one school has little or no pharmacognosy in it, while at another it is chiefly pharmacognosy."

The lack of enough well trained teachers who had an adequate knowledge of pharmacy *and* of the different sciences that entered into the broad scope of pharmacognosy was an important factor in the variability of the scope and the limited type of instruction in this subject. The physician was likely to teach medical *materia medica* and some therapeutics but little about the commerce or chemistry of drugs, whereas the botanist trained botanists who learned little of the history, chemistry or applications of the drugs.

With an ever increasing number of new drugs and attempts to discover origins, the pharmacognosy museums or *materia medica* collections developed. This macroscopic stage was succeeded by investigation of microscopic characters for identification and detection of adulterants, leading to studies of powdered drugs, both old and new, as the need for control

²¹ Apothecary 2:23-26 (1892).

²² Apothecary 3:145-156 (1893).

arose. As more attention was given to descriptive methods, accurate designations and numerical values began to appear in place of the earlier indefinite phraseology.

In discussing physiology and pharmacodynamics in schools of pharmacy R. H. Brown of the Northwestern faculty said,²³ "These two studies must necessarily go hand in hand. Physiology is a preparation for the study of the action of drugs on the animal economy. Therapeutical application of drugs and toxicology depend on knowledge of physiology." This viewpoint reflected the trend toward further specialization of instruction as had been evidenced by the addition of physiology to other chairs at the Kansas, Michigan, and New York colleges.

J. O. Schlotterbeck in a detailed discussion of the teaching of pharmacognosy at Michigan said,²⁴ "Pharmacology (*i.e.* pharmacodynamics) is taught in quite as detailed a manner as in many medical colleges, while it purports to give but a general survey of therapeutics. . . . Doses and antidotes then become logical deductions instead of abstract facts learned by rote." The offering by Michigan of a laboratory course in experimental pharmacology and by Michigan, Minnesota, Purdue, and Wisconsin of a laboratory course in bacteriology marks the final fragmentation of the old general *materia medica*.

The curriculum in *materia medica* as planned for first, second and third years²⁵ or for four years²⁶ indicated the revolution which had taken place in pharmaceutical education, particularly during this second period. Structural botany, systematic botany, physiological botany, microscopy, histology, pharmacognosy, chemical pharmacognosy, toxicology, posology, physiology, therapeutics, pharmacology or pharmacodynamics, drug assaying, food analysis, and bacteriology were offered by pharmacy schools either as separate courses

²³ Apothecary 2:9-10 (1892).

²⁴ Pharm. Era 11:249-50 (1894).

²⁵ A. R. L. Dohme, Proc. A.Ph.A. 43:436-7 (1895).

²⁶ School of Pharmacy, U. Mich., Proc. A.Ph.A. 43:438-40 (1895).

or in various combinations. The term "materia medica", which was to persist in pharmacy catalogs for many more years, had however lost any exact significance and as used to describe courses might mean much or little.

As a final point of interest, the establishment of medicinal plant gardens for instruction in pharmacognosy began with Schlotterbeck's efforts at Michigan in 1896, but this movement did not really progress until the twentieth century.

At the turn of the century we find then that *materia medica* as a concept persisted in curricular divisions but as a course description was disappearing in a group of courses. The realization that adequate foundation in the basic sciences should precede specialized studies, that vastly more time was needed to lay this foundation and to lead the student stepwise through courses of graduated difficulty comprising the superstructure, had produced the group of studies collectively referred to the *materia medica* division.

**1948 Annual Meeting of the American Institute of the
History of Pharmacy**

According to the Articles of Organization (Incorporation) of the American Institute of the History of Pharmacy, our annual meeting has to be held on the first Thursday of April of each year.

We herewith invite the members of the Institute to attend the 1948 meeting on Thursday, April 1st, at 7:30 P. M. at the Chemistry Building, Room 457, Madison, Wisconsin.

Program:

1. Report of the President, Dr. Arthur H. Uhl.
2. Report of the Secretary, Mr. Jennings Murphy
3. Report of the Treasurer, Mr. Sylvester Dretzka
4. Report of the Director, Dr. George Urdang
5. Plans for putting the Institute on a firm financial basis.
6. Miscellaneous.

A. H. Uhl, President

Vivisection: It's Moral Aspects

SISTER MARY KATERI, R.S.M.

Creighton University College of Pharmacy

The literal meaning of the word "vivisection" signifies the dissection of living creatures. According to popular thinking, the term has been extended to include the use of living animals for experimental purposes of any type. Today, as in times past, there are many anti-vivisectionists who go so far as to object even to the making of a hypodermic injection into an animal on the basis that such action constitutes cruelty to animals. Is their reasoning sound?

To answer this question, we might ask another question, "Do animals have any rights?" The answer lies in the fact that rights and duties are moral bonds which can exist only in a moral being, a person. Animals, in the Divine plan, are subordinated to the welfare of man; and obedience to this Divine plan, to the order established by the Creator of the universe, is the very essence of the moral law, which all are bound to respect. Thus, we may lawfully use animals for our reasonable wants and welfare, even though by so doing we inflict pain on them.

It must be remembered, however, that man does not have the same unrestricted dominion over these lower forms of life as he does over the non-sentient world (stones, trees, etc.). Since the Creator bestowed upon animals a sentient nature, and since we must act towards them in a manner conformable with their nature, unnecessary cruelty should be avoided. Besides producing injurious effects on the character of the perpetrator, cruelty to animals is an outrage of the divinely-established order, and is therefore morally wrong. This answers the question of the morality of vivisection.

Anti-vivisectionists set forth as their principal motive compassion for the defenseless animal and ignore the fact that experimentation is conducted solely for the benefit of suffering humanity. An incongruity between feeling for the animal and for the human being becomes evident at this point. That sentimentality over animals can make people very unreasonable (even when it is not a question of vivisection) may be illustrated by the following incident: A young woman was shown a picture taken during World War I on the battle fields of France. It depicted a horse pulling a cart of wounded, bleeding, suffering soldiers. After studying the picture, the woman exclaimed, "Oh, the poor horse! He looks so tired!" No word was uttered, however, in compassion for the unfortunate victims. The sympathy with the animal is in reality a disregard of man; yet the truth remains that man is the one who is superior to the animal. Over and above the corporal nature which he shares in common with the animal, man has an immortal soul endowed with memory, will, and understanding, by which he is able to go in thought from one end of the world to the other, by which he is able to be master of his actions, by which he is able to know God, to love Him, and to serve Him. In this the true superiority of man consists.

The next objection of the anti-vivisectionists, that experimentations on animals have no direct value for medical science, is easily refuted. As an indispensable aid for physiological and pathological research, these experiments afford a vivid picture of the details of the living organism, permit scientists to produce diseases artificially, to examine the resulting organic changes, and perhaps to find a remedy. Knowledge in every branch of medical science can thus be notably enlarged.

The marvelous growth of modern medical science began about three hundred years ago with Harvey's discovery of the circulation of the blood, achieved after innumerable vivisections of animals. In the seventeenth century, proof that intravenous injections of drugs produced effects more rapidly

came as a result of experiments on dogs by Jasper Schott, S. J. Vital information concerning digestion and assimilation, the cause of diabetes, the appearance of emboli in blood vessels, the technique of artificial respiration, the method of taking blood pressure, the surgical procedures on the hearts of "blue babies" and on the pituitary gland, has been gained by studies with small animals.

How has vivisection aided human welfare in the field of pharmacy? One incident alone may be told to illustrate its worth by affording a comparison. During the last illness of King Charles II of England in 1685, sixteen physicians in attendance prescribed a polished pill consisting of the dust of topaz, sapphire, ruby, emerald, coral, and gold. Needless to say, the king died with the crown jewels within him. Scientific experimentation alone could remove such absurdities.

It was on animals that men learned such things as the affinity between strychnine and the central nerve cells, between curare and the terminal filaments of motor nerves. The true pharmacological actions of innumerable drugs have been studied on animals: aconite, belladonna, colchicum, cocaine, ergot, morphine, quinine. The treatment of hydrophobia, indeed the entire field of serum therapeutics, rests on laborious experiments on animals. Vivisection has made possible the rapid progress accomplished in the prevention and control of contagious diseases. The pharmaceutical products for which animals are indispensable are essential to the health of the nation. In the U. S. P. and N. F. are listed antitoxins for diphtheria, gas gangrene, scarlet fever, tetanus; vaccines for rabies and smallpox; serums for pneumonia and meningitis. In addition, animals are used for the standardization of official products: cats for digitalis, rabbits for insulin, rats for vitamins A and D. Modern research is using ferrets for the study of influenza, monkeys for poliomyelitis. Thus, the objection of the anti-vivisectionists, that the use of animals for experimental purposes has no direct value for medical science, is undoubtedly false.

In summary, vivisection is permissible from the standpoint of morality and from the standpoint of usefulness. Anti-vivisectionists are merely imitators of the nineteenth century philosopher, Schopenhauer, who, while loving his dog, hated mankind.

The Aims of the Plant Science Seminar*

EDWARD P. CLAUS

University of Pittsburgh

The first report of the Plant Science Seminar to appear in the *Journal of the American Pharmaceutical Association* was printed in Volume 14, Number 7 (July 1925) in which announcement was made of the Third Meeting to be held at the University of Minnesota in 1925. In this announcement the statement is made: "The purpose of the Seminar is that each worker shall have the opportunity to pursue investigations in his particular field, to demonstrate his work and methods and to discuss the results with other workers."

In the *American Journal of Pharmacy* Volume 96, published in 1924, a complete report of the First Seminar is given. The name applied to the organization at that time was the Plant Science Laboratory Seminar and Dr. E. L. Newcomb was elected its first president. Although the Fifth Seminar which was held at the Missouri Botanical Garden in St. Louis in 1927 was called the Plant Science Seminar from which the word "laboratory" was omitted, the objectives still emphasized laboratory work and were three-fold. These aims were further accentuated at the Sixth Seminar in Boston in 1928, when Dr. Heber W. Youngken, in his chairman's address, stated: "The objects of the Seminar have been first, the bringing together annually of our professional contemporaries alike for social contacts and the mutual exchange of

*The Chairman's Address, read at the 1947 meeting at Chicago.

ideas and methods; secondly, opportunity for the acquisition of new facts by members through field trips in varied sections of the country and by laboratory practice and demonstrations in which everyone is invited to take part; thirdly, stimulation of "research in connection with pharmacognosy and plant chemistry."

The Plant Science Seminar has held to those objectives throughout the intervening years, although during the war the curtailed meetings prevented a full realization of laboratory demonstrations and collaborations. However, this year marks the first time since the 1941 Seminar held at Cranbrook Institute in Michigan, that we return to a full week of activities and to the type of program indicated by the purposes outlined above.

A glance at the program for the 1947 Seminar will serve to emphasize that collaborative laboratory sessions are planned, demonstrations are scheduled, and round table discussions are stressed. In addition, there are the field trip to Morton Arboretum, the trips to the Garfield Park Conservatory and the Chicago Natural History Museum, and the visit to the Abbott Laboratories plant. All of these features will be advantageous to better acquaintanceship and to the stimulating exchange of ideas.

It is fitting that our program this year offers laboratory work in pharmacognosy and related plant sciences. One of the factors deciding this arose at the final meeting of last year's Seminar in Pittsburgh at which a number of suggestions were presented. Your executive committee held a special meeting during the American Pharmaceutical Association convention the following week to consider these ideas. In the formation of the final program for 1947 your officers and local secretaries have tried to fulfill your desires. Each of you was given the opportunity to specify your choice of subjects for round table discussion and collaborative laboratory work and demonstrations. The final program, then, represents what the Seminar members want.

Pursuant to the three-fold purpose originally formulated, one of the aims of the Seminar should be to develop better teachers of pharmacognosy and subsequently to produce better equipped research workers. It is only by having *pharmacognosists* teach the subject of pharmacognosy that this can be achieved.

In a study of the catalogues of the pharmacy schools in the United States preparatory to the revision of our mailing list, I learned very forcibly that the subject of pharmacognosy is often taught by the professor of botany in the college of liberal arts, or by the professor of chemistry in the school of chemistry, or else by an individual who taught in addition, courses comprising practically all of the pharmaceutical curriculum. Although pharmacognosy embodies within itself much of botany and of chemistry, it nevertheless is a field of its own. It is not to be considered a branch of either botany or chemistry, nor yet a branch of pharmacology.

Pharmacognosy, in addition to its own specific subject matter, has a very important function to perform: that of linking pharmacy proper with pharmaceutical chemistry and pharmacology. Therefore, the viewpoint of the person teaching pharmacognosy courses must be a specialized one. He must attain an attitude which indicates that he is fully aware of the position that pharmacognosy has in pharmaceutical education.

To become specialized in this field, the prospective teacher must have taken training beyond the undergraduate level. In our country there are only about twenty-odd schools of pharmacy which offer a Master's degree with a major in pharmacognosy, and of these less than a dozen offer more advanced courses leading to the Ph.D. degree. The Plant Science Seminar, being the only organization of pharmacognosists, *MUST* be the driving force behind pharmacognosy to bring that subject to the attention of the authorities concerned with graduate work. The members of the Seminar should agree on what constitutes adequate work in the field in both undergraduate and graduate courses. We must see

eye to eye in making these decisions, and we should advance our arguments for a uniform subject matter.

Such a procedure means that we must all study our present courses and modernize them. Isolated facts of relatively little value in the total educational pattern for the undergraduate student should be discarded. Pharmacognosy should deal with the modern developments in the preparation of crude drugs and medicinal products for the market. To the undergraduate, it should be a subject of practical value, not merely a memorization of certain facts. To the graduate, it should indicate the tremendous number of problems still to be solved among which can be cited: the phytophysiology of medicinal and poisonous plants, the toxicity to humans of herbicides and insecticides, and the improvement of regulations concerning foods and drugs. To all, it should mean an integrated, uniform, and modern science.

In our deliberations at this 1947 Plant Science Seminar we all will have the opportunity of expressing our views regarding the course content of pharmacognosy. Our Tuesday morning meeting should throw much light on what our feelings are in this matter. We will discuss the scope of pharmacognosy courses: graduate and undergraduate, also new trends in pharmacognosy. As a climax, Dr. Elmer H. Wirth, who is chairman of the subcommittee on Achievement Test in Pharmacognosy of The Pharmaceutical Survey, will present his committee's report.

The officers of the 1947 Plant Science Seminar want each of you to feel free to discuss your views at tomorrow morning's meeting particularly. Out of this Seminar must come a unified understanding of the *intent* of pharmacognosy as well as its *content*.

The Plant Science Seminar should emerge from this 1947 meeting as the organization which represents pharmacognosy in the United States. Furthermore, it must become the recognized body to which leaders in the pharmaceutical field can look for guidance in Pharmacognosy.

General Concepts of Administration and Administrators and Their Relation to Pharmacy

Henry B. Webb*

I.

One may begin by asking: What is administration and of what does it consist? What are its principles, functions, and responsibilities? And what is requisite to sustain those principles, functions, and responsibilities?

The connotation is that administration is an "act or process of administering . . . dispensing or tendering to another . . . according to a prescribed formula . . ." Specifically, "the performance of the executive duties of an institution, business, or the like," and to administer is to "manage or direct the execution, application, or conduct of" such an institution, business, staff (personnel), or affairs as are pertinent.

As a specific example of what may conceivably be embraced by the term administration, Field Manual 100-10 United States Army, states that "when unqualified, administration includes all phases of military operations not involved in the terms *tactics* and *strategy*. It comprises supply, evacuation, sanitation, construction, maintenance, replacements, transportation, traffic control, salvage, graves registration, burials, computations pertaining to movements, personnel management, quartering, military government, martial law, censorship, and many other allied subjects." Equally extensive and appropriate examples occur in civilian administration; to cite the possible or entire range of functions is beyond the present scope of discussion.

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¹ Webster's Collegiate Dictionary, 5th ed., G. C. Merriman Co., 1943.

² Ibid.

Nor are the ideas enunciated here peculiar to, or confined, to the military. They are, rather, especially applicable to the conduct of affairs of either military or civilian establishments. Nor is the history of administration and administrative processes of the several categories, such as industry, business, educational institutions, government, *etc.*, to be set apart, if there is to be an understanding of administrative phenomena. As progress is made for the welfare of any community, be it social, industrial, educational, or other, we are faced with new and different administrative problems and approaches.

Successful administration requires the adoption of, and honest, effective interpretation of, practices appropriate to the persons, things, *et al.*, administered; the evaluation and enunciation of fundamental principles. Essentially, it depends upon continuous study, analysis, and appraisal, and as appraisal continues those concerned must accept the facts of the administrative, and administrator's sincerity and fairness.

Administration is influenced by degrees of stability and localization. Industry, for example, is relatively stable or fixed; the military, fluid or in motion, and, again, industry, with few exceptions, is localized, whereas the military is virtually world-wide. Economic states or conditions influence administration, and, in some instances, political, geographical, sociological, and other conditions affect administration.

Certain basic concepts must be adhered to in all sound administration. Irrespective of the number of staff assistants, there can be but one source of authority; secondly, each person in authority or control deals with as few subordinates as possible, and thirdly, there must be a system of control over the activities of subordinate units—a unit may comprise one or many persons, departments, *etc.* Organization should be vertical rather than horizontal. These principles dictate a staff organization. Although . . . "there is a vital respect in which military staff organization is in advance of anything yet developed," and though ". . . the modern military appli-

cation concreted in the term 'general staff' is something to which the student of organization [and administration] must give his careful attention"; it does not follow that the utilization of a "staff" is confined to the military. The essence of this reasoning has been stated elsewhere², but its recapitulation is in order:

Modern armies are not dissimilar in many respects to modern business with its numerous central and branch offices. To run either effectively and efficiently requires the application of the science of organization; further, the developments of problems in the military establishment is neither more or less remarkable than the development of similar problems in business. Both require and utilize a staff . . .

One of the factors leading to World War II reorganization of the War Department was the fact that the Chief of Staff had to deal with too many heads of staff sections who were on the same horizontal level of authority. Nor are the principles of decentralization new, for

. . . Moses chose able men out of all Israel and made them heads of the people, rulers of thousands, rulers of hundreds, rulers of fifties, and rulers of tens, and they judged the people at all seasons; the hard cases they brought unto Moses, but every small matter they judged themselves.³

It has been well said that "one can function efficiently in small organizations without understanding the organizational implications. So long as the direct, indirect, and cross-relationships in a small concern are few and simple, no organizational problems [will likely] arise. But when a disdain for organizational and procedural questions becomes the typical attitude of the staff of a large organization, then trouble, much trouble lies ahead. When everyone ignores or freely violates the organization charts and statements of function, when everyone pushes ahead in his own way with several people all trying to do much the same things and con-

² Nelson, O. L., Jr., *National Security and The General Staff*. Infantry Journal Press, 1946. By permission.

³ Webb, H. B.: *The United States General Staff, Its Evolution: An Epitome*. Military Review, 26: 33, 1946. Command and General Staff School, U. S. Army.

⁴ Exodus, 18: 25-26.

sequently getting all mixed up in each other's way, then confusion will exist and the situation . . ." becomes, by one description, "just a can of worms . . ."

Within their responsibilities for administration, administrators are largely concerned with problems of business management, personnel management, and records management. Each of these phases of administration embraces varied activities, some of which are peculiar to all administration; others are of more specific concern depending upon the character of the business or industry, such as: social and sociological problems; labor problems, recruitment and placement; job analyses, description and classification; training, *et al.* To present the field in a comprehensive light is likely to lead to unreality, for few existing programs may be found to illustrate the entire range of functions.

Records management is an important and large part of the whole. It is the constant function of this phase of administration to tabulate and evaluate the many methods necessary to efficient administration. It is not properly termed by "paper work" with which it is too often confused, although the greater percentage may be expressed in such a manner. Records management in correlating and furthering business and personnel management or administration, is increasingly making use of statistical methods and tools. An exceedingly simple example of such procedure is often observed in the form of the bivariate chart, in which, for example, time is represented as an independent variable on the x-axis, and other series on the y-axis. Other more complex statistical methods are equally necessary and common.

II.

The ultimate *raison d'être* of administration is success. A great percentage of business of all kinds is primarily administration; secondarily, work. Certain qualities are required of those who would be successful administrators. "Able

⁶ Nelson, O. L., Jr.: *National Security and The General Staff*. Infantry Journal Press. 1946. By permission.

people, working in accordance with a sound, clear cut plan of organization, are prime requisites to successful administration . . .”

Abilities, it may be argued by some, are native and not primarily acquired or prescribed by rules and regulations. In a measure this is true. *Learning* can, however, enhance and increase the value of abilities.

When the Roman Republic passed its apogee near the beginning of our era, one indication of its state of being was the decline of learning. Such a remark is not meant to preface the idea that the decline and fall of the United States is imminent, or that learning is decadent. It may, however, serve as a reminder that learning and success, administrative or other, are kinetic and not static forces or conditions, and that they thrive best in an atmosphere of inquiry, investigation and exploration. It does not, however, necessarily imply that their realization requires resort to the use of *sesquipedalia verba*, or the accumulation of data, which may do little more than stultify the user or the accumulator. We may reasonably call these qualities or attributes scholarship, and well inquire if the administrator, or successful administration, need resort to such lofty attainment.

A dictionary^{*} definition states that scholarship is the “character or qualities of a scholar; attainments in science or literature, formerly in classical literature; learning; or education; instruction.” It may well mean: Does the person know how to formulate genuine problems—a problem being nothing more or less than an unanswered question!—and then cope with the problem in an intelligent and adequate manner. Certainly this concept is required in all good administrators. How, in some measure, is this attained?

Scholarship is nurtured on literature and requires reading over a wide range of subjects and texts. The great works

^{*}Ickes, H.: Quoted in *National Security and The General Staff*, *vide supra*. By permission.

^{**} Webster's Collegiate Dictionary, 5th ed., G. C. Merriman Co., 1943.

of literature embody ideas which have changed, or are changing, the world. It does not always follow that one should concentrate on the latest books and articles, but the best books and articles in the clearest, most intelligible language. By reading what has been written clearly, one may learn how to make his ideas clearer to himself and to others. There can be no mutual understanding without clear ideas.

The narrow fields of specialism are consonant with scholarship or learning, but he who restricts himself to such narrow fields is not a scholar—or an administrator. The scholar projects his interests, studies and investigations in all directions beyond the boundaries of his specialty. Nor is this assertion incompatible with the statement of General George Marshall that "the successful army of today is composed of specialists, thoroughly trained in every detail . . . and, above all, organized into a perfect team."⁹ Again, the final justification is success and "you cannot have success . . . unless you have 'a well trained team', and you cannot have 'a well trained team' unless you have well trained instructors [and administrators]."¹⁰

The best administrators should aspire to be something of scholars in the sense in which we here speak. There can be no room on a "perfect team" for the paralogist or sophist.

The primal foundation of all endeavor, and the field of administration is no exception, lies in work, diligent, absorbing, persistent work. The logician, Hobbes, once said that "reason is attained by industry"; Epictetus in his *Discourses* has said that "it is reason which shapes and regulates all other things [and] it ought not itself be left in disorder." The eminent Osler once said, "I propose to tell you the secret of life as I have seen the game played, and as I have tried to play it myself. . . . I propose to give you the master word in the hope, yes, the full assurance, that some of you at least will lay hold upon it to your profit. . . . It is the open sesame to

⁹ *Military Review*, 26: 125, 1946.

¹⁰ Feehan, Sean. In *An Cosantoir (Eire)*. June, 1943, digested in *Military Review*.

every portal, the great equalizer in the world, the true philosopher's stone which transmutes all the best metal of humanity into gold. The stupid man among you it will make bright, the bright man brilliant and the brilliant student steady. With the magic word in your heart all things are possible, and without it all study is vanity and vexation. . . . And the master word is *work*, a little one, but fraught with momentous consequences if you can but write it on the tables of your heart and bind it upon your forehead."

If the primal foundation of these ideas and attainments, and of successful administration, lies in work, then much of the structure above the foundation is to be built of materials gathered from the writings of persons possessing these attainments. Reading is a habit, which, once cultivated, continues. The more diligently and more extensively one reads, the more enjoyable. The labor of reading long since will have become a pleasure and a satisfaction. There is often suggested as an excuse for not doing extensive and broadly distributed reading the plaint that so much is published, no one can read it all. This latter assertion is true, but multiplication but increases the number of pages that may be useful to the administrator in the formulation and solution of problems.

To work and reading should be added investigation. Even simple observations are useful and carry the stimulus and satisfaction that comes to the matured and skilled investigator. Sustained investigation is paramount to good administration.

Finally, success in any endeavor in the last analysis is based on broad knowledge, and not by any means on erudition. It is stimulated by the influence of others, but it cannot be passively absorbed. To meet the future, no preparation is more important than broad knowledge whose attainment has been begun early and steadily added to. In this world of changing economics, politics, science, social science, and war, what is to happen in the future is known to no man;

the unknown will be faced and solved most effectively by those who are best trained. A process of reasoning may be an indifferent thing; but our judgment concerning it is not indifferent; for it is either knowledge, or opinion, or mistake.

These concepts are basically requisite to the administrator and the attainment of good administration, and success.

III.

The subjectiveness of this thesis to now has been purposely directed toward generalities in the administrative or management field. They are as equally and as forcefully applicable to the management or administration of the profession of pharmacy, especially personnel relationships in pharmacy. Manifestly, their degree of application will vary proportionately with the size of the organization administered.

It should be further evident that the administration of personnel relationships has assumed a position of increasing importance, both to employee and employer, in recent years, and the profession of pharmacy should offer no exception.

The president of the American Management Association is credited with the statement that "the most dynamic element that management deals with is its people". As an adjunct to this statement by Mr. Dodd, it may well be added and emphasized that

. . . personnel management is simply one phase of the general field of management. In that sense it plays an important part in all types of modern business, in retail as well as wholesale merchandising, in manufacturing and transportation, in banking and education, in short in every situation where certain individuals entrusted with the duties of management seek to secure and maintain the efficient cooperation of other persons who perform the functions of the enterprise.

As has been previously stressed, the objective of all endeavor is success. Its attainment stems from diverse elements of which the human is by far the most important.

The treatment, management, or administration of this element is a prime factor in the realization of the objective. It follows that unless the component parts of the human element, hopes, prejudices, ambitions, shortcomings, and in sum, happiness, are attained, success will not be an *fait accompli*.

As a part of these factors, pharmacy management or administration must recognize, and meet, the problems of hours, wage and salary rates, hospitalization, retirement, etc. Certain of these elements are, to be sure, recognized and available in large organizations. It would redound to the benefit of the small organization, especially the retailer, to give careful consideration to these elements in personnel administration. Certain of them are not, unfortunately, ready for immediate solution. The employee must be further educated, but largely and primarily such education must be directed toward, and reflected from, the employer and the public.

It may well be questioned, because of some of these factors, for example, hours and salary, whether retail pharmacy today is attracting the professional personnel that lend character and integrity to an old and lustrous profession. To elevate its educational standards and maintain its high professional status, pharmaceutical education and administration should give further and deep analysis to these principles and concepts of administration.

MARRIAGES

Mr. Grover C. Bowles, instructor in pharmacy, University of Tennessee, and Miss Mary Lois Van Inwagen, during the Christmas holidays, at Memphis.

President Ivor Griffith, Philadelphia College of Pharmacy and Science, and Hilda McDonald, East Orange, New Jersey, on September 27, 1947, at the Mission Avenue Presbyterian Church in East Orange.

Mr. Seymour Levitch of Newark and Miss Charlotte Bolton, assistant in pharmacy, Rutgers University, on December 31, 1947, in Newark.

Mr. C. K. Raley, instructor in pharmacy, University of Texas, and Miss Rebecca Whisenant of Dallas, Texas, on November 30, 1947, at the home of the bride's mother in Harper, Texas.

Minutes Executive Committee Meeting
of the
American Association of Colleges of Pharmacy

Deshler-Wallick Hotel
Columbus, Ohio
December 5-6, 1947

The Executive Committee met at 9:45 A. M. December 5, 1947 at the Deshler-Wallick Hotel, Columbus, Ohio with Chairman Christensen presiding. Members present: Deans Christensen, Hayman, Burt, Ballard, Newton, Uhl, Wilson, Professor Johnson, Editor Lyman and Secretary Zopf. Guests present: Dr. E. C. Elliott, Director of The Pharmaceutical Survey.

It was moved that the minutes of the August 25th meeting be approved as published in *The Journal*; carried.

The report of the Treasurer was read and approved.

The budget was given preliminary discussion but action was deferred until other items of the agenda could be considered.

Editor Lyman in his report on *The Journal* discussed the problems of the Editor's office mentioning particularly the problems of the increasing size of *The Journal* and subsequent increase in cost of publication, manner of disposition for the copies of past numbers of *The Journal* now stored at the University of Nebraska College of Pharmacy, methods of increasing circulation, question of accepting advertising for *The Journal* and the increasing number of requests from foreign sources.

It was moved and seconded that the Item 9A in the 1947-1948 budget (*American Journal of Pharmaceutical Education—Printing*) be increased from \$2500 to \$3200; carried.

It was moved and seconded that the back numbers of *The American Journal of Pharmaceutical Education* be offered to the libraries of schools and colleges of medicine, dentistry, veterinary medicine, education and new colleges of pharmacy, secretaries of the state pharmaceutical associations and pharmaceutical houses without cost other than the transportation fee; carried.

Dr. Elliott suggested the convenience of an annotative index for all the issues of *The Journal*. He suggested a very short (two or three line) description of committee reports and article theme.

It was moved that Editor Lyman investigate the possibility of compiling such an index; carried.

Uhl moved, seconded by Johnson that *The Journal* be made available to a subscription agency and that the rate for *The Journal* to such agencies be established on the basis of a 25 per cent reduction; carried.

It was moved by Burt, seconded by Johnson that the Executive Committee approve a policy of accepting pharmaceutical advertising for *The Journal* as approved by a sub-committee of the Executive Committee; carried.

Chairman Christensen appointed the following as members of this committee: Editor Lyman, Director Uhl and Dean Burt.

At the suggestion of Editor Lyman the Secretary was directed to send a communication of thanks to President J. Bryon McCormick of the University of Arizona for the space and clerical assistance given by the University of Arizona for *The Journal*.

Dean Burt moved, seconded by Johnson that all extra copies of the *Proceedings* now held in the office of the Secretary be made available at \$1.00 per volume.

It was moved and seconded that the Report of the Editor of *The Journal* be accepted; carried.

Wilson moved, seconded by Ballard that an Item No. 4 be added to "estimated receipts" in the 1947-1948 budget as cash—transfer from checking account in the amount of \$1000.00; carried.

On motion of Johnson, seconded by Burt that Item No. 5—1947-1948 budget (Interim Meetings of Executive Committee) be changed to read Interim Meetings of Executive Committee and Travel Expenses of President to Pharmaceutical Survey Committee Meetings and that the sum be increased from \$1200.00 to \$1400.00; carried.

President Uhl's report stressed:

1. Full time Secretary for the Association
2. Increased time allotment for Teachers Conferences
3. Teacher shortage
4. Encouragement of library exchange
5. Encourage more schools toward graduate work
6. Support for and method of implementing The Survey report.

Johnson moved that the report of the President be accepted, seconded by Newton; carried.

Luncheon Recess—1:05 P. M.

December 5, 1947

Reconvened 2:30 P. M.

Dr. E. C. Elliott was asked to discuss The Pharmaceutical Survey. He discussed the findings of The Survey with regard to supply and demand for registered pharmacists. He emphasized his belief that our enrollment was over-subscribed and that the profession could absorb the graduates in pharmacy up to 1951.

Chairman Christensen suggested this as a topic for discussion at the District Meetings of Boards and Colleges of Pharmacy.

Function and coordination of purpose of the Curriculum Committee of the A.A.C.P. and The Pharmaceutical Survey was also discussed.

Dr. Elliott sought the opinion of the members on the proposed Seminars on Pharmacy and Pharmaceutical Economics which will be financed by the American Foundation for Pharmaceutical Education.

Dr. Elliott requested information regarding the A.A.C.P. assuming responsibility of such Seminars:

1. as to where they will be held
2. selection of personnel
3. arrange the program
4. arrange for money to be paid to the institution thru the Association.
5. assure the American Council on Education of a complete report on the program.

Dr. Elliott discussed state board questions and asked for the best source for competent judgment on the validity of board questions. The members of the Executive Committee agreed to make suggestions to President Uhl, who in turn would transmit the names of these individuals to Dr. Elliott.

Practical experience was thoroughly discussed. The Executive Committee expressed their thanks to Dr. Elliott for his message on the progress of The Survey.

Dinner recess—5:55 P. M.

Reconvened 8:15 P. M.

President Uhl moved, seconded by Johnson that the Chairman of the Executive Committee be directed to transmit with endorsement the recommendation for limitation of enrollment from The Pharmaceutical Survey of the American Council on Education to the deans of the colleges of pharmacy and to the president of the school and universities; carried.

Ballard moved, seconded by Dean Burt that the plan for seminars on Pharmacy and Pharmaceutical Economics, as outlined by Dr. Elliott, is approved in principle and that the A.A.C.P. assume the responsibilities for carrying out these projects as subsidized by the American Foundation for Pharmaceutical Education; carried.

President Uhl moved, seconded by Dean Ballard that the Chairman of the Executive Committee appoint a sub-committee from the Executive Committee to assume the arrangements for the seminars; carried.

Places suggested for the Pharmaceutical Economics Seminar—The Ohio State University.

Pharmacy Seminar—Purdue University, State University of Iowa, and University of Wisconsin.

Newton moved, seconded by Johnson that we delay action on the question of a delegate to the Pan-American Congress of Pharmacy to be held in Havana in 1948 until a specific and more formal invitation is received.

Wilson moved, seconded by Johnson that the President be empowered to appoint a Secretary for the Graduate Teachers Conference because of the ineligibility of Dr. J. E. Orr; carried. President Uhl appointed Dr. Lloyd Harris.

On motion of Burt, seconded by Newton the President was empowered to appoint a Chairman representing the colleges for District No. 6 to replace Dr. T. T. Dietrich who is ineligible.

President Uhl appointed Dr. Ralph W. Clark.

Adjourned—10:15 P. M.

Second Session

The Executive Committee met at 9:30 A. M. December 6, with Dean Christensen presiding. Members present: Deans Christensen, Ballard, Burt, Hayman, Newton, Uhl, Wilson, Professor Johnson, Editor Lyman and Secretary Zopf.

On motion by Burt, seconded by Johnson, Editor Lyman was authorized to have printed two hundred reprints of the Constitution and By-Laws and five hundred reprints of the List of Member Colleges; carried.

The Executive Committee approved the policy of printing the Committee Reports in the July issue of *The Journal* and agreed that extra copies of this issue of *The Journal* be made available at the San Francisco meeting.

The Secretary was requested to notify all officers of committee and Teachers Conferences that reports for publication must be available by May 29.

General details for the San Francisco meeting, August 8-10 were briefly discussed. President Uhl was requested to arrange for a speaker at the Joint Banquet.

In response to an invitation by resolution from the American Society of Hospital Pharmacists, Wilson moved, seconded by Johnson that Chairman Christensen and Secretary Zopf endeavor to locate someone in the approximate area of the meeting place for the next Institute on Hospital Pharmacy to represent the A.A.C.P.; carried.

The report of the special Committee on Membership of Schools and Colleges of Pharmacy of Foreign countries was read. Following thorough discussion and thru agreement of Uhl and Wilson, members of this special committee, the following recommendation was submitted. The committee recommends that foreign colleges and schools of Pharmacy, except the University of the Philippines, not be accepted as members of the A.A.C.P. and that these schools be extended annually an invitation to attend the annual meetings.

Wilson moved, seconded by President Uhl that the report of the Special Committee be received and that another Committee of the Executive Committee be appointed to study admission of foreign colleges with particular reference to Canadian Schools, carried. President Uhl appointed the following to this committee: Burt, Newton, and Hayman.

Chairman Christensen read a communication from Secretary Pat Costello of N.A.B.P. regarding co-operation in formulating programs for district meetings of Boards and Colleges. On motion by Newton, seconded by Ballard the report was approved.

Chairman Christensen read a communication from Lloyd E. Blauch, Editor of *Higher Education* requesting an article on the development of pharmaceutical education.

It was moved by Wilson, seconded by Johnson that Dr. Urdang be requested to write this article and that it be reviewed by a sub-committee from the Executive Committee before publication, carried. The chairman appointed the following committee: Lyman, Uhl and Burt.

Discussion favored a full time secretary for the A.A.C.P. Means of raising funds for this office were given general consideration.

The question of a roster of Teachers of Pharmacy was referred to the following as a special committee to study this problem and to report at the August meeting of the Council: Johnson, Wilson, and Ballard.

Chairman Christensen led the discussion on the question, Should a professional degree be adopted for Pharmacy?

It was moved by Wilson, seconded by Johnson that the Chairman of the Executive Committee appoint a committee to study the question of a professional degree for Pharmacy.

Recess—12:55 P. M.

Reconvened 2:30 P. M.

The following committee was appointed to formulate details of the Pharmacy and Pharmaceutical Economics seminars: President Uhl, Chairman Christensen, Secretary Zopf.

Dr. Elliott discussed in considerable detail the possibility of developing a greater unification of interest between the American Council on Pharmaceutical Education and the A.A.C.P. He suggested that the employment of a full-time secretary or executive agent to serve both organizations would tend to unify the interest in the field of pharmaceutical education. If such an office were established it should be centrally located, preferably in Chicago where the American Medical Association and American Dental Association headquarters are now located. In general the discussion of the afternoon centered around proposals for the re-organization of the Council and for a more effective means of developing co-ordination between this Association and the Council.

The Executive Committee of the A. A. C. P. considered the following resolutions passed at the 1947 convention:

1. Appreciation to the Foundation—approved.
2. Appreciation to The Survey—approved.
3. Pharmacy predictive tests—action was deferred until further information is available.
4. Requesting financial support for the Journal from the Foundation—action deferred.
5. Entrance requirements to colleges of pharmacy—The Executive Committee approved the resolution and instructed the secretary to transmit this information to Professor James of Temple University, Chairman of the Committee on Educational and Membership Standards.
6. Committee on Audio-Visual Education—The Executive Committee recommended that President Uhl appoint a committee to study the costs involved and to submit a plan.
7. Foundation Fellowships to permit some teaching—The Executive Committee approved this recommendation and requested the Secretary to transmit this action to the Foundation with the request that the Foundation take action.
8. Committee on Lectureship Tours—It was moved that in view of the \$1500.00 now in the hands of the Treasurer, the officers of the Association be empowered to activate the plan.

9. Financing of a continuous testing program after that portion of The Survey has been completed. The Executive Committee recommends that action be deferred until studies now in progress and plans for financing a continuous testing program now under consideration by The Pharmaceutical Survey be completed.
10. Establishment of new schools of pharmacy—The Executive Committee suggested that this resolution be deferred to the American Council on Pharmaceutical Education, with the opinion that the establishment of new schools of pharmacy be discouraged.
11. Need for a Committee on Distributive Education—The Executive Committee referred this resolution to President Uhl for consideration.
12. Report of Committee on Research—The Executive Committee recommends that the Chairman of the Committee on Research be requested to contact Dr. Elliott with regard to the action of this recommendation particularly as it concerns the return of research men from industry.
13. Each college to appoint a historian—The Secretary was instructed to communicate with all colleges and encourage such appointment.
14. Financing Committee on Curriculum—The Secretary was instructed to inform the Chairman of the Curriculum Committee that the sum of \$485.76 has been allocated from the present budget for the use of this committee.
15. Committee on Teachers Conferences—The Executive Committee approved retaining the 1946-1947 committee for another year to serve in an advisory capacity to the committee elected for this year. (1947-1948).
16. Experiment to correlate academic with practical—A resolution from the University of Washington; action deferred.
17. Resolutions of thanks to the Surgeons General of the Army and Navy; approved.
18. Committee to formulate a program to support UNESCO; referred to President Uhl.

Adjourned—4:50 P. M.

LOUIS C. ZOPF, *Secretary*

Editorials

Grades: They Know Where They Stand

The many problems presented in grading have without doubt contributed much unhappiness to the members of the teaching profession and, in some cases, have been the cause of some of them turning to other fields of endeavor.

It is difficult to look hard-hearted at the student who honestly thought he was doing better. Another frequent complaint is from the student who has found out that he was one-half or one per cent below an A or a B or a passing grade. He probably could have made the next higher grade had he only known where he stood.

As a method to let the student know where he stands, two suggestions are presented:

1. A system of frequent testing in the form of daily, biweekly, or weekly testing.
2. A running average with frequent status reports.

It is generally conceded that in many types of courses, frequent quizzes stimulate the student to greater effort and, consequently, greater accomplishment. This also eliminates the problem of the student who suffers from fear, or does not know what to expect, or who misunderstands his examination on the mid-term or final of a "two exam" course. In practice it often works well to give mid-term and final examinations little more emphasis than the daily or biweekly quiz.

In addition to the frequent quizzes, a "running average" will assist the student a great deal. Although it requires considerable time, it is not difficult to record grades and, after each quiz grade, add the total points of the last quiz to the previous quizzes and list in the next column the

total quiz points. In the following column the quiz average can be recorded. A table of multiples may be computed which will cut down the time of averaging after each quiz. In many cases this work could be left to a secretary or an assistant. As each quiz is handed back, two grades appear on the quiz, first, the grade for the quiz and second, the individual's quiz average.

Once a week the averages are listed in the form of a frequency distribution table and the grades assigned as "present status". At the beginning of the following lecture the "present status" is listed on the blackboard, e.g., A=94, B=86, C=79, D=71. From the "present status" each week, each student knows exactly where he stands. He knows how much he must raise his quiz grades to attain the next letter grade, or how firm the present letter grade status is. Naturally the "present status" on the following week may show different figures. The student is also aware of the fact that the status of the final week will be his course grade.

Student's ability to pull out of the "F" group is surprising. One may conscientiously and without fear of justifiable criticism assign an "F" to the student who is still in the "F" group at the end of the term. The number of "F's" decreases because of the increased pressure of the system on the students in the lower end of the "normal" curve, to raise his grade.

To most educators, the time expended will be more than compensated for in the satisfaction of having no spoken or silent complaints.

Students without the natural endowment to carry on pharmaceutical work are discouraged early enough in their curriculum that they will be able to change their plans without harboring a perpetual resentment for the instructor. They feel that they have been given a fair trial.

TRACEY G. CALL,
University of Wyoming,

The President's Page

What About The School Libraries?

In the "Proceedings Number" of this journal (Vol. XI, No. 4, Pages 725-729), the report kindly given at the Milwaukee meeting on "The Medical Library Association" by Edith Dernehl, Librarian, Marquette University School of Medicine, was presented to the members of the A.A.C.P. It should be given the sincere attention of all concerned. Although not even mentioning the situation of and in the libraries of the American Schools of Pharmacy, this article touches one of the most problematic issues within the problem of "adequate" facilities to be required of our schools.

That our libraries represent a serious problem rather than a satisfactory part of our educational equipment is not a new discovery and has been stated time and again. Our Committee on Libraries, under the very active and able chairmanship of Professor C. O. Lee of Purdue University, has during the past several years done a remarkable job. There is hardly another field of pure or applied science in which so much informative material has been offered by a voluntary committee. We have all reason to be proud, for instance, of the comprehensive lists of journals devoted to pharmacy and its basic or related sciences, including bibliographical notes and ascertaining the correct abbreviations, which were compiled on the initiative and by members of our Library Committee and published in this *Journal*. But of what use is even the best information if the number of those who are taking advantage of it is so pitifully small as we have to admit it to be in the case of our school libraries?

The old question to be heard whenever the consequences of neglect become obvious pops up: Who cares? *It is one of the most urgent and immediate tasks of every school of pharmacy in the country to see to it that there is somebody*

who cares and who is given the necessary time and means to look after the library needs.

An "adequate" library belongs to the requirements for admission in the A.A.C.P. The question naturally arises, what criteria are and can be used for the determination of this "adequacy". Is it the number of books only, or have some specific requirements to be met as to the fields which are dealt with and the date of publication? As to the conditions under which libraries, medical, veterinary, biological, and *pharmaceutical*, may join "The Medical Library Association" and take part in its exchange of books, journals, etc., Miss Dernehl, in her report mentioned above, stated:

"To qualify, a library must have not less than 1000 volumes of medical and allied scientific literature, of which not less than 500 must consist of books and periodicals published within ten years of the date of application. It must receive regularly not less than 25 current medical or allied scientific serials in good standing, maintain regular stated hours and be in charge of qualified attendants. To be in good standing, a library must present a list of duplicates every two years."

Can we, by replacing the word "medical" by "pharmaceutical" adopt these criteria for our schools and make them obligatory? One thousand volumes of pharmaceutical and allied scientific literature does not seem to be too much to ask for. The field of pharmacy and its allied sciences is so broad that this number might be exceeded in the libraries of most of our schools. As far as the requirement of 500 volumes of more recent vintage is concerned, the rapid progress in all sciences concerned will make it all the more reasonable as volumes of journals are included and the bound sets of the 25 current journals required—most schools undoubtedly will have subscribed to or receive many more than the 250 volumes in 10 years.

More difficult is the question of "stated hours" and "*qualified* attendants." The term "qualified" means a graduate of an accredited library school. Hence it would not be suffi-

cient to have the Dean's secretary, or somebody of the staff, sit in the room supposed to be the library and take care of the library work as a sideline. The ideal would be an attendant who is both a pharmacist and a qualified librarian. In my opinion, here is a field for some of our female graduates interested in the more literary side of the profession. I can imagine that quite a number of the young women would take up the library course and qualify as librarians after graduation from a school of pharmacy if they could count on work in this area. The assistance these pharmacist-librarians would be able to render to the school at large would make the expense for their salary very well spent.

It will be mainly for lack of a "qualified attendant" that at the time being only a limited number of schools of pharmacy would be able to join "The Medical Library Association" and take advantage of the most useful possibility of exchanging duplicates. This offers a problem not only to small colleges but to big university schools with many thousands of books likewise, for the simple reason that the bulk of their library treasures is housed in the university main library building and taken care of by the library staff, while the department harbors only a limited selection used by the students in their current work. These "department libraries" very rarely have a "qualified" attendant. I hope that in these cases some temporary arrangement can be made which makes membership possible, although the letter of the requirement is not met. The ideal is undoubtedly full-fledged libraries with full-fledged attendants. This is intended to open, not to close, the discussion.

ARTHUR H. UHL

The Editor's Page

In a brief article in this issue entitled "Qualifying for the Course in Dispensing", Dean Howard C. Newton has called attention to a very basic principle which, if universally applied, would result in better teaching. The plan requires, however, as he suggests, cooperation of the instructional staff all down the line. Long have we been convinced that the chief difficulty in our teaching institutions is due to poor teaching rather than to the curricular content. We have discovered the same difficulty in editing textbooks. There are too many individuals who do not realize the function of a teaching text. They cannot bring themselves to writing a text whose subject matter and the manner of presentation lies within the field of comprehension of the student. Too many writers are more concerned about presenting material in a way that will exhibit the breadth and depth of their knowledge to their colleagues. This, of course, is far beyond the level of the undergraduate's ability to comprehend. Such texts are of value, of course, for those who go beyond the undergraduate level, but when presented to the undergraduate they result in producing what the student calls "mystery courses". As we view the whole field of pharmaceutical education we are inclined to believe that the poorest teaching is being done in the fields of general and pharmaceutical chemistry. There is much more concern expressed by many instructors as to whether something is chemistry or pharmacy than to present the subject matter in a way that will attain Dean Newton's objective. We should remember that the student does not care whether something is chemistry, pharmacy or something else. He wants to be prepared in the best possible way for the studies that lie ahead. It is this lack of coordination of courses and the instructor's desires to impress the student with his depth of knowledge that are responsible for a large amount of our poor teaching. Once Dr. James E. LeRossignol, a noted economist and former dean of the College of Business Administration at the University

of Nebraska, made the statement that his students said he did the best teaching in the courses he knew least about. This is not an argument for lack of preparation on the part of the instructor, but it is a student's warning that the instructor should present his subject on the level the student can grasp at his particular stage of growth. On another occasion Dean Charles H. Oldfather of the College of Liberal Arts of the University of Nebraska made the statement that the faculty of the University could not possibly justify to the taxpayer the number of student failures that occurred. Bearing these opinions of scholarly men of long experience in mind, it might be well to consider the number of failures in an instructor's class as evidence of poor teaching. At any rate, Dean Newton's suggestion of cooperative instruction deserves our most serious consideration. The principle of cooperative teaching is further justified by the fact that there is now a movement, country wide, among university administrators that loss of time, money and energy should be conserved by the introduction of cooperative methods in research. It is time for us to quit laying the poor product of our schools to the dumbness of the student or the nature of the curriculum. The failures we may find are due rather to the lack of intelligence and the lack of using horse sense in the teaching process.

The *Pitt Capsule*, which has been produced in mimeographed form, appears in its December issue as an eight page printed sheet. It is well done; the printing and the paper are excellent, and the content of the publication is dignified. The students of Pittsburgh are to be congratulated on freeing their publication of the chamber of commerce type of propaganda that is so common in student publications. Students in our colleges should be urged and supported in their journalistic efforts. It provides a training school for clarity of thinking and expression which is so sorely needed in our colleges of pharmacy if the pharmacist is to fulfill his mission as an educated citizen when he leaves colleges and enters

community life. So many student publications that come to the Editor's desk show hastiness in preparation, lack of careful proof reading—look as if they had been thrown together without due consideration to the character of the contents, and show every evidence of cheap and often foolish propaganda. Such publications do the student, and the institution, and the cause of pharmacy more harm than good. The finest criterion to measure an institution by is the character of the student body and the institution's product. The student body in producing the printed page deserves the advice, the support, and any helpfulness that the faculty and alumni can give it. This is just as necessary as any guidance the faculty can give the student body in the class room. The *Pitt Capsule* is evidence that this is the policy at Pittsburgh.

Suppose you had received a letter and when you had opened it you discovered a check for seventy-two dollars to be paid to the Treasurer of the American Association of Colleges of Pharmacy for eighteen subscriptions to the *American Journal of Pharmaceutical Education* to be sent to the president and every member of the *Board of Trustees* of a college of pharmacy. What would be your guess as to the name of the college of pharmacy, and what would your guess be as to who the dean was who performed such an epic-making accomplishment?

If your guess as to the college was any other than the Brooklyn College of Pharmacy, Long Island University, and if your guess as to the dean was any other than the inimitable Hugo Schaefer, you would be wrong. Other deans have done nobly in that they have sold *The Journal* to their faculties, 100 per cent. But who ever heard of a dean who sold it to one member of the Board of Trustees, to say nothing of having sold it to the whole group of eighteen? And the basis of the sale was even more remarkable. It was not done on a charity basis to give support to a good cause; but these trustees subscribed for it in the hope that between

its covers they would find something that would be helpful to them in guiding the destiny of the institution which is their responsibility. And that very objective is a challenge to the Editor, to the collaborators, to the deans of the colleges, and to pharmaceutical educators in general to make the *Journal* of value to those who serve our colleges as administrators. In the months to come this should be one of our special concerns. Dean Schaefer's master hand may have opened up a way to bring pharmaceutical education and pharmaceutical administrators into a more intimate relationship, which will result in a better understanding between those who teach and those who administer our teaching institutions. Such an understanding can result only in the betterment of the educative process. Dean Schaefer is not only the capital salesman of 1947; he has opened a wider field of service for *The Journal*. We shall do our best not to fail him in his objective.

More than three decades had passed since I first rode down Broadway in New York in a sightseeing bus, listening to the jargon of a spieler who declared that that great city sheltered more Germans than Berlin, more Frenchmen than Paris, more Danes than Copenhagen, more Jews than Palestine, more Italians than Rome. Whether all this was so I did not know, but the massiveness of the structures and the depth of the canyons with their never-ending streams of human beings added to the strangeness and to my lonesomeness. The Statute of Liberty was the only friend I had in New York. In my boyhood I had read of her crossing the sea and coming to rest on the island across the bay. I pictured her as the eighth wonder of the world, and in my mind she eclipsed the other seven. I left New York with a feeling that Manhattan was a bit of foreign land dropped at the doorstep of America. But as the years passed and I formed attachments to men who lived in Montclair but made their living in New York, although the buildings grew higher and the canyons deeper and the human throng greater, there

crept through me the feeling that New York might be a part of the homeland. Nevertheless, it was always with a sensation of safety and a feeling of exultation that I boarded a Pennsylvania train and began the westward run toward the land where vision has its freedom limited only by the horizon and the stars.

The evening of the third of December had come. A great dining room in the Hotel Pennsylvania was filled to capacity with old friends and new friends representing every aspect of pharmaceutical endeavor from the country of the great plains eastward to the sea. No one but the recipient of the award could appreciate the great effort the New York pharmacists had made to put New York under the recipient's skin and even deeper, to gnaw at his heart strings. There was his beloved Presbyterian pastor of the yesteryears for the invocation. There were the members of the recipient's family, all that were available. There were his students of the early days, who had become a part of New York and the national body pharmaceutic. There were his companions of many decades of service to bring a message of good cheer. And, as if that were not enough, they brought the boundless west to the dinner table with *Home on the Range*. I have printed other citations in the *Journal* which have been made on the occasion of the conferring of the Remington Award. I shall print the 1947 citation, not because it is directed to myself, but because in it and between the lines the reader will sense the kindness, the refinement, the devotion, the affection, and the sincerity that is New York's and Dr. Curt P. Wimmer's, in a language I do not have the words to express.

The morning following, as I gazed across the bay from the Battery, the Statue of Liberty had taken on a new meaning to me. There she stood, with torch in hand, beckoning to the suppressed peoples across the sea, and lighting their way to New York, the Gateway to the Heart of America. As I left New York it was with a tinge of sadness, for I felt her again tugging at my heart strings—for she too had become my home.

To every one who had a part in the program and to the hundreds in the unseen audience who sent messages of cheer and good will I am most appreciative and grateful.

RUFUS A. LYMAN

1949 Seminar of the American Institute of the History of Pharmacy
(Preliminary Announcement)

The Seminar of the A.I.P.H., which was started in 1941 at the University of Wisconsin, Madison, Wisconsin, was held for the second time at Purdue University, Lafayette, Indiana, in 1942, and was suspended during the emergency period from 1943 to 1947, will be revived this year, in July, at the University of Wisconsin.

The exact date and the detailed program of the two day session will be made known as soon as possible. The general topic will be: *Means and Methods of Teaching History of Pharmacy*. This topic is the repetition of the one dealt with at the first Seminar of the A.I.P.H. in 1941. We thought it worth while to have it discussed once again, because in the meantime quite a number of schools have introduced regular courses in the History of Pharmacy, and experience has accumulated which was not available in 1941. Hence it may be expected that this Seminar will be attended by a much larger group than its predecessor and offer more factual and actual material.

Although the Seminar appeals to active and presumptive teachers of the history of pharmacy primarily, it is open to everybody interested in the field.

Whoever thinks that he has something to contribute to the topic mentioned above, is heartily invited to send the title and, if possible, an abstract of his contribution to the undersigned. It would facilitate the problem of finding quarters if those intending to attend the meeting would inform the undersigned as soon as possible.

George Urdang, Director.

Gleanings from the Editor's Mail

A number of the Trustees of the Brooklyn College of Pharmacy attended your Remington Medal presentation dinner and were delighted to be there and highly interested and impressed with your remarks and those of the various other speakers.

A few days after the dinner we had a regular meeting of our College Board of Trustees and reference was made to the dinner. I took the opportunity to show the members several copies of the *American Journal of Pharmaceutical Education*. This I had done on several occasions in past years, but apparently I did not do a good selling job at those times.

The present meeting coming so soon after the members had heard your speech was a splendid opportunity to again present the Journal. All of them agreed that the publication contained a wealth of information to help enable them to more intelligently guide the policies of the college and to judge the trends in pharmaceutical education. They all expressed a desire to become subscribers.

Accordingly I am herewith enclosing the subscription price for eighteen subscriptions of the Journal to be sent to all our College officers and trustees including the President of the University as per the enclosed list.

Brooklyn, N. Y.
December 12, 1947

Hugo H. Schaefer,
Dean

You solicited "food for thought" items and I have one to toss into your hopper of gleanings. We all seem to agree that there is a great need for pharmaceutical educators at present. It seems to me that we presently obtain educators as a by-product and not as a real product of itself. Our educational institutions produce trained men for the retail outlets and trained men in research for the industries, yet we do not train pharmaceutical educators to teach. Do we have any colleges of pharmacy that offer a curriculum to fill the needs in the teaching of pharmacy or any that could produce pharmaceutical educators and administrators? Maybe you have some ideas on the subject and if so I'd like to hear them.

Pocatello, Idaho
December 29, 1947

Ivan Rowland,
Idaho State College,
College of Pharmacy

In your issue of last April (p. 308) appeared the nucleus of an idea over the pen of Prof. Brecht which I think deserves serious consideration. It seems to me that altho it is manifestly more important that teachers of pharmacy proper should have continuing drug store experience, it would also be highly beneficial if other members of pharmacy college staffs should spend some time each year in a drug store. Perhaps one afternoon a week or four (4) weeks in the summer would constitute enough of a contact to remain in touch with present-day trends in the professional pursuit which most of our graduates will follow. Registration as pharmacist should also, it seems to me, be one of the s.q.n's of the pharmaceutical educator.

Men in pharmacy, and the related fields of pharmaceutical education—pharmaceutical chemistry, pharmacognosy, and pharmacology—ought to be encouraged to engage in consultative work as a best means of keeping in touch with the problems of manufacturers and dealers. Summer work on a full time basis for a month or more with commercial firms engaged in the practical phases of the subjects which the instructor treats academically in the class room would gain him both economic and cultural advantages, at the same time that the industry would profit both in having the services of a specialist and indirectly in contributing to the training of its own future potential technical personnel. It occurs to me that if some such organization as the A.A.C.P. or the A.F.P.E. would set up an agency to serve as a sort of clearing house for this type of employment much good would result all around.

Buffalo, N. Y.
December 20, 1947

Geo. M. Hocking
University of Buffalo
School of Pharmacy

Speaking generally the whole situation as regards pharmacy is in a state of flux at the present time. I feel our overall position as pharmacists is favorable, and will be for some years to come. I personally favor the 5 year course at the earliest possible date, with emphasis on more cultural studies as a background to technical studies.

San Francisco, California
October 24, 1947

Henry Colle

(Mr. Colle is a retail druggist of San Francisco.—Editor.)

Under date of November 4, 1947, I wrote to General Raymond W. Bliss, Office of the Surgeon General, Technical Information Office, Washington, D. C., a letter from which the following is abstracted:

"Through the courtesy of your office I have, as Editor of the *American Journal of Pharmaceutical Education*, been receiving the news notice releases from your office. These I am very glad to have, as there is frequently something in them that pharmaceutical educators are very much interested in and I can reprint them or comment upon them in *The Journal*.

"I notice under 'Distribution' you state that the release is sent to 'State, National and South American Medical Journals; Dental, Veterinary and Nursing Journals, Science Editors ...' *et cetera*. I am suggesting that it would be a nice thing to insert the word 'Pharmacy' after 'Dental', or someplace along the line. I suppose it doesn't make any difference; nevertheless, it would make the druggists of America feel good to see pharmacy given recognition along with the other journals."

Rufus A. Lyman.

Under date of November 17, 1947, the following letter was received in reply:

"I am taking the liberty of answering your good letter of 4 November to General Bliss, during the latter's temporary absence from the office.

"Your suggestion in Paragraph 2 is well taken and we are immediately changing our stencil to insert the word 'Pharmacy,' as you suggest.

"I assure you that the Surgeon General will be very happy to be placed on the mailing list of the *American Journal of Pharmaceutical Education*.

"I am sure you are fully cognizant of the fact that the present Surgeon General and his staff are fully aware of the emphasis which should be placed on pharmacy and pharmaceutical matters and your suggestions are quite in line with our current thinking.

"With appreciation, I remain,"

Washington D. C.
November 17, 1947.

George E. Armstrong
Brigadier General, USA
Deputy Surgeon General

Notes and News

University of Buffalo, School of Pharmacy.—Dr. George D. Hocking has been elected a member of the Executive Committee of the Committee on National Formulary, replacing the late Dr. Elmer Wirth. He will serve as chairman of the sub-committee on Pharmacognosy. He has also been appointed a member of the sub-committee on Botany and Pharmacognosy of the Committee for Revision of the United States Pharmacopoeia.—Prof. Margaret Swisher is serving as a collaborator in the preparation of a standard biochemistry test for the American Chemical Society.—Mr. D. Pritchard, a retail druggist of Buffalo, who is also a special lecturer in the School of Pharmacy, has been elected first vice president of the American Pharmaceutical Association.—Mr. J. S. Hill, who is also a special lecturer in pharmacy, is now president of the American College of Apothecaries.—Prof. Lockie and his daughter Mary were slightly injured in a recent automobile accident.—A Christmas party by students and alumni was held on December 18, at the Transit Valley Country Club. Dean Lemon was presented with the traditional necktie and a handsome medical dictionary by the students.

Cincinnati College of Pharmacy, affiliated with the University of Cincinnati.—The junior class entertained the faculty and student body at a holiday convocation at Hamilton County Memorial Hall on December 19, 1947.—The annual senior dance was held at the Gibson Roof Garden on the evening of December 18, 1947, on which occasion the faculty, student body and alumni were guests.—The student body is now busily engaged in gathering material for the new student publication, "Pestle and Pen," the first number of which will appear soon.—Spacious quarters have been placed at the disposal of a museum project for the display of pharmaceutical apparatus and material of educational and historical interest that the institution has acquired during its 98 years of existence.—Sixty selected freshmen enrolled in September.—During the summer new and enlarged laboratories were provided for bacteriology, pharmacognosy, experimental physiology and pharmacology. One new class room was made available; the library was moved to new and larger quarters, and the sanitary and service facilities were modernized.—Dr. Lauretta Fox has joined the faculty as associate professor of biological science and has charge of the work in experimental physiology and pharmacology.—Jack Baumring and Warren Nakazawa, both recent graduates, have been appointed to instructorships for the current year.—Mr. John S. Beatty, president of the board of trustees, has joined the administrative staff on an active basis and is devoting full time effort to the college program.

Columbia University, College of Pharmacy.—Josephine Siragusa (Columbia) and Martin and Irving Katz (St. John's) have been admitted as candidates for the Masters degree as fellows of the American Foundation for Pharmaceutical Education.—Chong Loon Hooi, '42, is director of Plasma and Infusion Fluids Department, National Defense Medical Laboratory, Shanghai, China.—The Borden Foundation has established an annual award of \$300 effective September 1, 1948, to be presented to the student who has maintained the highest grades in the three preceding years.—A tablet production unit consisting of granulator, drying cabinet, sifters and tablet machines, together with coating and polishing pans, has been set up in the manufacturing laboratory. Ointment and ampul units will be added.—A portrait of the late Dr. Jean Lascoff was presented to the college at a recent meeting of the board of trustees. Chairman Thompson in accepting it spoke of Dr. Lascoff's activities in various aspects of pharmacy and of his service to the school.—Mr. A. L. van Ameringen recently concluded a seminar on perfume evaluation and appreciation, extending through six sessions. It was attended by executives, buyers and editors in the perfume and cosmetic industry.—Laboratory work has been included in the teaching of physiology in order to give the student a basis for the understanding of pharmacology.—Dr. Schon, of the Danish School of Pharmacy, visited the college recently and discussed pharmaceutical education in the United States as compared with that in Denmark.—Samuel Dreyer, '11, has presented a public address system which has been installed in the main lecture hall.—New members of the teaching staff in various departments are Profs. Horace N. Carter, Charles J. Heimersheim, and Leonard M. Chavkin. Teaching assistants are Joseph Kanig, Lisbeth Eisler, Louise Phillips, Robert Anderson, Edward Brennglass, Vito Bellino, Lucy Clausen, Margaret Staud, Leonie Neslter, and William Wong.

Duquesne University, School of Pharmacy.—The Council of the American Pharmaceutical Association recently gave formal approval for the formation of the Duquesne University School of Pharmacy Student Branch of the A. Ph. A. The charter has been received and will soon be presented to the Branch at a formal assembly.—Additions to the Duquesne faculty include Alfred Halpern of New York City, assistant professor of pharmacology and biochemistry; and Joseph Zapotocky of Columbus, Ohio, assistant professor of pharmacy and chemistry. Dr. Halpern holds a B.S. in pharmacy degree from St. John's University, M.S. from Columbia University, and Ph.D. from the University of Iowa. Mr. Zapotocky has done all his graduate and undergraduate work at the School of Pharmacy of Ohio State University. He will receive the Ph.D. degree in December, 1947.—Dr. Charles H. Becker, for several years professor of pharmacy, resigned in August to join the staff of the University of Florida.—Miss Betty

Shaughnesy represented the Tau Chapter of Lambda Kappa Sigma at the Sorority's Eastern Regional Meeting, November 1 and 2, at the Hotel Commodore in New York City.—Newly elected officers of Rho Chi, Alpha Beta Chapter, are: President, Jan Suhanin; Vice President, Rubin Shore; Secretary-Treasurer, Rose Marie Rumora; Faculty Advisor, Dr. Alfred Halpern.

University of Florida, School of Pharmacy.—The Borden Award of \$300 to a senior for high scholarship during his first three years was given to Carl H. Fuhrer. The Emrich Prize for scholarship during the junior year was won by Heard Harris.—Newly initiated members of Rho Chi are: Nereida C. Rodriguez, Edith Ware, Byron K. Andrews, Charles H. Bradley, Carl H. Fuhrer, Orion M. Hall, Samuel S. Lawler, Malcolm L. McSwean Jr., and Edward Pedera Jr.—Dr. J. S. Allen, of the New York State Department of Education, has been appointed Vice-President of the University, effective February 1.

Fordham University, College of Pharmacy.—At a recent meeting of the Whelan Drug Pharmaceutical Society, Dean James H. Kidder gave a report on the role of pharmacy in the last world war. He stressed the increasing importance of the medical activities which are being developed in the Army and Navy which will be required in any future military enterprise and the responsibility of pharmacists toward the plans.—In September, Dr. Leonard J. Piccoli made a tour of the West Indies visiting clinics, hospitals, and schools of medicine and pharmacy. He was guest speaker at the annual convention of the College of Pharmacists of Puerto Rico. For his efforts in bringing the medical, pharmaceutical and dental groups together he was awarded a special plaque by the College of Pharmacists.—The war memorial drive to remodel the Chapel as a memorial to Fordham men who lost their lives in the world war resulted in a net profit of \$53,000.—In December, Donald A. Clarke, apothecary chief of the New York Hospital, addressed the students on the subject "The Sociological position of Hospital Pharmacy."—New members of the faculty are Walter Markunas and Joseph Setaro, and Conrad J. Floridia in pharmacology.—Donald A. Clarke was guest speaker at the fall meeting of the Alumni Association. Dr. Clarke's subject was "The Sociological Position of the Hospital Pharmacist".—A Christmas party was given at the beginning of the holiday season for both students and faculty.—The annual retreat was conducted in December for the Catholic students by Rev. George Flattery, S.J., and the lectures for the protestant students were given by Rev. Charles F. Connor S.J.

The George Washington University School of Pharmacy.—The Alpha Zeta Omega fraternity has been granted full recognition as a

campus activity, and it is anticipated that a chapter will soon be installed under the direction of the local alumni chapter.—A gift of \$100 has been received, and will be used in the purchase of library books.—Dr. James A. Crabtree, Deputy Surgeon General of the United States Public Health Service, has been appointed to the Seminar Staff as Professorial Lecturer on Public Health. Dr. Crabtree's appointment was made following the resignation of former Deputy Surgeon General Dr. Warren F. Draper, now retired from active duty in the Public Health Service.—Through the cooperation of the Travelers Auxiliary, the local organization of medical service representatives, a series of monthly lectures on various therapeutic classes of pharmaceuticals will be initiated in January. The series, sponsored by the student branch of the A. Ph. A., will include discussions of Antibiotics, Anti-Histamines, Hypnotics, and Insulin.—A special University convocation was held on December 16, 1947, to honor President Cloyd Heck Marvin upon his completion of twenty years of service to the University.

Idaho State College, College of Pharmacy.—Dr. Carl W. McIntosh, the new president, began his service in November.—Profs. E. E. Roscoe and Ivan Rowland are assisting Dean Leonard in revising the pharmaceutical curriculum.—Dr. Brainard Hines has been appointed to service in the department of pharmacology, and Floyd Anderson has been named to assist in dispensing. Five assistants have been added in order to reduce the teaching load of the staff. A licensed pharmacist has been secured as a secretary to the dean and a retired druggist to supervise the stock room personnel.—A departmental library began to function in September, with Joan Whipple as full time librarian.—A department of pharmaceutical economics has been developed under the guidance of T. H. Schlosser. Courses included are Principles of Economics, Accounting, Commercial Art, Drug Store Merchandising, and Commercial Display. A model drug store has also been put into operation.—A special laboratory for pharmacology is being equipped and will be ready soon. Also a research laboratory for the specific use of the faculty is about ready for occupancy.—Over one hundred of the students have joined the Idaho State Pharmaceutical Association recently. Two years ago they likewise joined the American Pharmaceutical Association.—In order to better serve the needs of pharmacy, the staff has given much time and thought to over-enrollment and its inherent problems. In 1946 a very large freshman class was allowed to enter. In the fall of 1947 the freshman class was limited to eighty and to eligible Idaho residents only. The number allowed to register in the fall of 1948 will be drastically curtailed through requiring higher standards of scholarship. Consideration is also being given to the plan of requiring one year of pre-professional training in the fall of 1948. Action, however, may be delayed until the report of The Pharmaceutical Survey is available.

The State University of Iowa, College of Pharmacy.—On the evening of December 16, 1947, Dean and Mrs. R. A. Kuever entertained the entire pharmacy staff and their wives, including the graduate students, at a turkey dinner at the Iowa Union. After the dinner the group sang Christmas carols to the accompaniment of the piano-accordian played by Mrs. Kuever.—Wendle L. Kerr and Henry F. Baumann have been advanced in rank from assistant to instructor.—Mrs. Mildred W. Thompson, '47, has been appointed assistant pharmacist in the University Hospitals.—Dean Kuever spoke on "Recent Prescription Problems" at six of the twelve junior conventions of the Iowa Pharmaceutical Association held in October.—The scholarships for the current academic year have been awarded as follows: The American Foundation for Pharmaceutical Education scholarships, to Hugh H. Keasling, Robert L. Van Horne and Gail A. Wiese; the Carbide and Carbon Chemicals Corporation scholarships to Mareshwar V. Nadkarni and Donald B. Meyers; the Pharmacy Foundation scholarships to Marian Kirby and Ray I. Swart; the Ford Hopkins scholarships, to James Conine and Galer Miller; and the Schlegel Drug Stores, Inc., scholarships, of Davenport, to Mary Wilke and Edward Elstad.—Marybeth Hartman was granted a half-time assistantship as hospital pharmacist in the University Hospitals. During the rest of her time she is engaged in research under a grant provided by the United States Pharmacopoeial Committee.

University of Kansas, School of Pharmacy.—Dr. Duane G. Wenzel has been appointed to the faculty as assistant professor of pharmacy, beginning the second semester. He comes from the University of Wisconsin where he received the Ph.D. in January.—The University has appropriated \$15,000 for equipping a laboratory for graduate students in pharmaceutical chemistry. The Ph.D. is now being offered in that field under the direction of Dr. J. H. Burckhalter.—Dr. Ralph W. Clark had charge of a panel discussion at the Kansas Pharmaceutical Association fall convention and will have a similar function at the spring convention in March.

University of Kansas City, School of Pharmacy.—Dr. Willard Hoehn, formerly senior chemist and director of research for the George A. Breon Company of Kansas City, has been appointed associate professor of graduate chemistry in the school of pharmacy. He will offer undergraduate courses in pharmaceutical chemistry and graduate courses in chemistry in the graduate school of the University. Dr. Hoehn's undergraduate training was in the University of Illinois, and his doctorate in Iowa State College. He is a member of many learned societies and has had more than thirty publications in chemical research credited to him in the past ten years. Before coming to Kansas City to direct chemical research for the George A. Breon Company, he held a fellowship from the Mayo Foundation for Research.

Long Island University, Brooklyn College of Pharmacy.—On

November 19, the faculty and board of trustees surprised Dean Hugo Schaeffer with a testimonial dinner in commemoration of his ten years of service as dean of the college. Dean Schaefer was presented with a television set as a memento of his untiring and unselfish labors.—Mrs. Wilhelmina Heimerzheim, chairman of the Executive Committee, is slowly recovering from an infection which has confined her to a hospital for a month.—Prof. Berl S. Alstdorf is convalescing nicely after a recent operation.

University of Minnesota, College of Pharmacy.—At the fall quarter commencement exercises on December 18, 1947 the M.S. and Ph.D. degrees were conferred upon Mr. Rugnar Almen and Mr. William S. Benica, respectively. Two students also received B.S. degrees.—On December 8, seniors A. F. Musich, W. J. Post and V. Vergin were initiated into Zeta Chapter of Phi Lambda Upsilon, honorary chemical society.—On February 23-25, 1948, the University will offer the eleventh refresher course for pharmacists in the Center for Continuation Study building on the main campus.—The University suffered the loss of two emeritus faculty members during the past months. On October 21, 1947 Dean Emeritus Frederick J. Wulling passed from this world. Memorial services were held on October 25, at Lakewood Memorial Chapel. On November 11, 1947, Emeritus Professor Gustav Bachman died suddenly at his home.—Speakers at fall meetings of the Student Branch of the A. Ph. A. have been Joseph Dahl and Henry H. Gregg, both prominent local pharmacists.—Officers of Mu Chapter, Rho Chi Society, are W. J. Rost, President; J. Schermerhorn, Vice President; and Dr. W. J. Hadley, Secretary-Treasurer.—Dr. Ralph Voigt of the University of Illinois College of Pharmacy was a campus visitor during the Christmas holidays.—Dr. C. V. Netz was appointed by Governor Youngdahl to serve the unexpired term of Dr. Bachman on the State Board of Health and Vital Statistics.—The members of the faculty and their wives attended a reception given by President and Mrs. Morrill at their home on December 21, 1947.—On January 10, 1948, at the Minneapolis Public Library, Dr. Earl B. Fischer addressed the Minnesota Botanical Society on the subject "Medicinal Plants of Minnesota." Colored slides were used.—Miss Hallie Bruce, Chief Pharmacist at the University Hospitals, expects to return to work late in January after a vacation recommended by her physician.

University of Nebraska, College of Pharmacy.—Dean J. B. and Mrs. Burt attended the Midwestern Conference of Pharmaceutical Associations held in Kansas City, Missouri in November.—Dean Burt and Mr. Meryl Mayo attended the Remington Medal Dinner tendered Dr. R. A. Lyman at the Hotel Pennsylvania in New York on December

3.—President Sylvester W. Dertzka of the American Pharmaceutical Association was the guest speaker at an open meeting of the student branch of the American Pharmaceutical Association on November 19. President Dertzka's subject was *Progress Through Organization*. A complimentary dinner was given the same evening at the University Club in the President's honor, sponsored by the College of Pharmacy.—Dr. Donald M. Pace, chairman of the department of physiology and pharmacology, has published two researches recently. One, *Oxygen Consumption and Carbon Dioxide Elimination in Tetrahymena Geleii Furgason*, appeared in the June issue of the *Biological Bulletin*. Dr. Edwin D. Lyman, who this year holds a fellowship in the Harvard University School of Public Health, was co-author with Dr. Pace. The other article, *The Effects of Vitamins and Growth-Promoting Substance on Growth in Chilomonas Paramecium*, appeared in numbers 2 and 3 of Volume V, *Experimental Medicine and Surgery*.—A final tabulation shows the total registration for the first semester to be 214, of whom 57 are freshmen, 92 are sophomores, 55 are juniors and 10 are seniors. There are 7 graduate students.—Kappa Epsilon is making an effort to reactivate the alumni chapter.—Robert H. Gilmour, senior; Donald D. Ediger, junior; C. Jack Christensen, sophomore; and Robert D. Bauer have been elected presidents of their respective classes. The class presidents serve as members of the council of the student branch of the American Pharmaceutical Association.—Volume II of American Pharmacy has just been published by the J. B. Lippincott Company of Philadelphia. This is the second in a series of textbooks in pharmacy under the Editorship of Dean Emeritus R. A. Lyman. Chapter 7, entitled *Parenteral Preparations* was written by Dr. Paul Janke of the department of pharmacy and pharmaceutical chemistry. Chapters 11 and 12, entitled *Surgical Appliances* and *Surgical Dressings and Related Supplies* respectively were written by Dr. Edwin D. Lyman, former instructor in the department of physiology and pharmacology.

University of North Carolina, School of Pharmacy.—233 students were enrolled in the school for the fall quarter.—During the first week a weiner roast was given for the students and faculty to get acquainted with the first year students. Smokers were given by Phi Delta Chi and Kappa Psi.—The state association and school served 350 luncheons of ham and beans to visiting pharmacists and guests preceding the football game with Georgia.—Rho Chi has initiated twelve undergraduates: Paul Bissette, Jr., William Brantley, Hal Hawkins, Larry Harris, James Lovette, Russell Young, Mary Jane Bradford, Earle Caldwell, Wilbur Provo, Van Secrest, Thomas Aiken Pace, Wesley Collier, C. C. Wheeler, and John Ross, and two graduate students: Albert Jowdy and Bill Sheffield. The Rho Chi First Year Prize was awarded to Floyd Jones.—Dr. Fred Semeniuk recently ad-

dressed a joint group of pharmacists and physicians at Roanoke Rapids on *Organic Pesticides*.—The entire faculty took part in the second annual Professional Seminar sponsored by the state association and the school.—On November 13, the School of Pharmacy celebrated its fiftieth anniversary. The two principal addresses were given by Dean M. L. Jacobs, *Fifty years of Pharmaceutical Progress*, and Dr. Walter H. Hartung of the University of Maryland, *Graduate Pharmaceutical Research*. Five alumni and the president of the student body gave reminiscences of their respective decades.—Appropriate greetings were extended from the University, the University Alumni Association, the North Carolina Pharmaceutical Association and the Board of Pharmacy. Dr. E. A. Brecht was the presiding officer. The occasion was ended by a dinner at the Carolina Inn.—Kappa Epsilon gave an interesting and humorous play, *A Tale in Time or Bedlam in the Boudoir*, as its entry in the contest for the best student program for the student branch of the N.C.P.A.—Dr. Herman O. Thompson again taught the course in *materia medica* to the student nurses at Watts Hospital in Durham.—Dr. E. A. Brecht was notified by the Council of the American Pharmaceutical Association of his election to a ten-year term on the Committee on National Formulary.—Mrs. Doris Bullard Hawkins, M. S., was added to the faculty as instructor of pharmacy for the winter and spring quarters.

Ohio State University, College of Pharmacy.—Dr. I. R. Fahmy, head of the department of pharmacognosy of Fouad University, Cairo, Egypt, recently spent several days as a guest of Amin Abdel-Latif, a member of his faculty who is pursuing graduate studies in pharmacognosy at Ohio State. Dr. Fahmy returned to Cairo by way of London, where he represented Egypt at the meeting of the International Pharmacopoeial Committee which met in that city in October.—During the past summer three persons were awarded Ph.D. degrees with majors in pharmaceutical subjects; namely, Woodrow R. Byrum in pharmacology and to Roy C. Darlington and Anthony S. Ridolfo in pharmacy. Drs. Byrum and Ridolfo have accepted appointments to the pharmacy staff with rank as assistant professors, and Dr. Darlington to the pharmacy staff of Howard University as associate professor.—Joseph A. Zapotocky, graduate student in pharmaceutical chemistry, is now on the pharmacy staff of Duquesne University.—Mrs. Marian Derfer, '46, has been appointed assistant instructor in pharmacy.—Dr. George H. McFadden, research associate, Ohio State University Research Foundation, has been appointed part-time lecturer in pharmaceutical chemistry. He has had twelve years experience as a teacher in pharmacy schools.—Dr. John W. Nelson, formerly of Oregon State, has been appointed associate professor and will teach pharmacognosy.—American Foundation for Pharmaceutical Education Fellowships have been awarded to Martin Barr and Leon Lichtin, both Masters from the

Philadelphia College of Pharmacy and Science, and to Melvin Rubin, a graduate of Rutgers. All are enrolled for graduate work.—Arthur Tye, a graduate of Melbourne College of Pharmacy, has been appointed as a graduate assistant. Mr. Tye at various periods has taught pharmacy and *materia medica* in the Peking Union Medical College, was a lecturer and examiner in North China Pharmacy School, and lecturer in Pei Ta Medical School, and for several years was head of the Peiping Union Medical College Hospital and chief pharmacist of the Fu Min Laboratories.

University of Oklahoma, School of Pharmacy.—Newly elected officers of Kappa Psi are Orville Avery, president; Robert Grantham, treasurer; Lex Shelby, historian; and Lee Jones, chaplain.—Ovetta Rothmire is the newly elected secretary of the student association.—A number of new additions have been made to the library and to the Dorrance Military Pharmaceutical Museum.—On November 21, the Rho chapter of Phi Delta Chi initiated, as an honorary member, the Hon. Roy J. Turner, governor of Oklahoma.

Philadelphia College of Pharmacy & Science.—Dr. Arthur Osol who was associate editor of the 22nd edition of the United States Dispensatory, and co-editor of the 23rd edition, is editor-in-chief of the 24th edition which has just appeared from the press of the Lippincott Company.—President Ivor Griffith spoke recently before a meeting of the Drug, Chemical and Allied Trades Section of the New York Board of Trade at Shawnee, Pennsylvania.—Dr. Arno Viehoefer, who at one time was in charge of the department of biological sciences in this college, is now in Europe as the representative of the Technical Industrial Intelligence Division of the United States Department of Commerce. Recently he was the government representative at the First International Rheumatology Congress in Copenhagen, Denmark. A paper which he delivered several months ago at the International Congress on Industrial Chemistry was published in Paris in the August *Products Pharmaceutiques*.—New appointments to the teaching staff are Charles G. Abbott, William F. Ball, Walter M. Bejuki, and Hellmuth Simons in biology; William G. Burns and Dr. Lewis J. Kleckner in chemistry; Herbert J. Flack, Jr., and Edna R. Gold in pharmacy; Milton Calesnick, George S. Kling, Jr., and Aaron E. Wasserman in bacteriology; Drs. Robert R. Frantz, H. Roebling Knoch and Joseph Grant in pharmacognosy; Arleigh P. Hess, Jr., and James H. Street in economics; Donald E. Landin in mathematics and physics; Charles E. Welch, Jr., in English; and John A. Novack in German.—Dr. Griffith is now in Europe where he will make business calls in six or seven countries. He will also visit his native village of Rhiewlas, Wales, where he will see his 90 year old uncle, the only living member of his family in his native land.—The reconstruction program of the college is now complete and the

students' accommodations and the teaching quarters are now adequate for the present high enrollment.—The Alumni Association will hold its reunion dinner on February 23. Mr. J. Mervin Rosenberger of the Smith, Kline, and French Co., president of the Alumni Association, will be toastmaster at the dinner.

University of Pittsburgh, College of Pharmacy.—Dean Edward C. Reif attended the testimonial dinner on December 3, to Dr. Rufus A. Lyman who was awarded the Remington Medal by the New York Branch of the American Pharmaceutical Association. On his return trip by way of Washington he called on Col. Othmar F. Goriup, '29, who was recently appointed head of the newly established Medical Service Corps of the U. S. Army.—Dr. Stephen Wilson, '25, has just received his twenty-year pin on completion of his twentieth year of teaching services in the school.—New members of the teaching staff are Mr. Lewis Yagle and Drs. Erle Ayers, Joseph H. Wells, and Dwight L. Deardorff.

Rutgers University, College of Pharmacy.—Dr. Ernest Little, professor of chemistry and formerly dean, is President-elect of the American Pharmaceutical Association.—The College of Pharmacy, in cooperation with the Northern New Jersey Branch of the American Pharmaceutical Association, announced the speakers and their topics for the fourth annual series of seminar lectures as follows: Dr. E. C. Elliott, Director of The Pharmaceutical Survey, subject to be announced; Dr. F. F. Yonkman, Director of Research, Ciba Pharmaceutical Products Company, *Anti-histimetic Agents in Allergy*; Mr. Victor Lewitus, retail pharmacist of New York, *Recent Therapeutic Developments*; Dr. Elmer L. Sevringshaus, Director of Clinical Research, Hoffman-LaRoche, and associates, Dr. J. Lee and L. O Randall, *Anti-Spasmodic Drugs—Their Chemistry, Pharmacology, and Clinical Use*; Dr. Selman A. Waksman, Professor and Research Specialist in Microbiology of Rutgers University, discoverer of streptomycin, *Antibiotics and their Utilization*.—Dr. Howard B. Lewis, University of Michigan, delivered the first Rho Chi lecture in December. His subject was *The Development of the Hormone Hypothesis*. Using the thyroid as an example he explained the method used in identifying, isolating, and synthesizing hormones. It was an instructive and refreshing presentation.—Following the traditional yearly custom the faculty and their wives met for an informal dinner and an evening of fellowship and entertainment on January 14.—Dr. R. A. Deno attended the meetings of the American Association for the Advancement of Science in Chicago in December.

Medical College of the State of South Carolina, School of Pharmacy.—Dr. W. A. Prout has been reappointed chairman of the Committee of State Representation of the Scientific Section of the

American Pharmaceutical Association. He has also been appointed on the Committee of Pharmacy and Queries of the South Carolina Pharmaceutical Association.—Dr. J. Hampton Hoch presented a paper on *Quantitative Microscopical Methods in Pharmacognosy* at the Chicago meeting of the Plant Science Seminar. Dr. Hoch has been reappointed as an auxiliary member of the U. S. Pharmacopoeia sub-committee on Botany and Pharmacognosy. He has also been asked to serve on the Consultative Committee on Instruction in Pharmacognosy of The Pharmaceutical Survey.—*The Mosaic* is the title of the publication initiated by the students of the school last May. J. E. Hiott is editor and Dr. Hoch is faculty advisor.—A chapter of Phi Delta Chi was installed last May with the chartering of the local Alpha Kappa group. Dr. Hoch, who is an honorary member, is serving as faculty advisor to the group.

Temple University, School of Pharmacy.—The school offered classes in its new \$1,500,000 pharmacy-dental building with a registration of 386. Remodeling of the large building delayed the opening until October 20. The physical plant is one of the finest in the country. The building, which has nearly five acres of floor space, is shared with the dental school. Some laboratories are shared by both schools, but where the needs are not identical individual facilities have been provided. The building provides space for a 40,000 volume library, an auditorium seating more than 800, and a cafeteria serving the entire personnel. The freshman class was limited to approximately 100 persons. Only one person was accepted for every ten that applied. The student traveling the greatest distance to enroll was Charlotte Wong, who transferred into the freshman class from Hawaii. She covered the entire distance to Philadelphia by plane.—Dr. Harry W. Mantz has been appointed to the chair of pharmacy which Dean Kendig held for forty years. Dean Kendig continues to serve both as dean and professor of public health. Dr. Mantz has served the university since 1926, first as instructor and then as associate professor of pharmacy, and later as assistant to the dean. (We learn with sorrow after this was written that Dr. Mantz died on Christmas day.—Ed.)

University of Tennessee, School of Pharmacy.—Fifteen seniors were graduated at the summer quarter commencement in September, 1947.—Eighty-one new students (sophomores) were admitted at the beginning of the fall quarter in September. New students are admitted but once each year and in the fall quarter. With sixty-four juniors and four special students the grand total for the fall quarter was one hundred forty-nine.—On November 8, 1947, the class of 1932 had a reunion to attend the Tennessee—"Ole Miss" football game. Dean Crowe was presented with a set of Ronson table lighters. All but one of the class was in business for himself.—On October 23, Mr. Charles Evans of Warrenton, Georgia, former president of the A.Ph.A. and now chair-

man of the House of Delegates, spoke to the students and their families and friends for the initial meeting of the new student branch of the A.Ph.A. He presented the group with a framed copy of the Code of Ethics of the A.Ph.A. The guest speaker at the second meeting of the student branch in December was Sister Clara Francis, chief pharmacist at St. Joseph's Hospital of Memphis.—Dean Crowe has been honored by the alumni and friends who contributed to a fund for having his portrait painted by a distinguished artist. Plans for the unveiling of the portrait and a dinner in connection will be made later.—Dr. Karl Goldner has been advanced to a full professorship in pharmacy and Dr. Albert H. Musick to a full professorship in pharmacognosy.—The entire School of Pharmacy plans to visit the Eli Lilly Laboratories March 3, 4, 5, 1948.—Dr. Bertha Baron spent the Christmas holidays in Texas. Dr. Albert Musick spent the month of December in California, his father having passed away on the 10th of the month.—New members of the faculty are Grover Bowles in pharmacy and Dr. Bertha Baron in pharmacognosy.

University of Texas, College of Pharmacy.—Dr. Charles O. Wilson of the University of Minnesota gave a lecture before the general university body early in December on sleep producing drugs.—The pharmacy operated by the school has been moved into new quarters and equipped with appropriate fixtures which will be used to display sick room and hospital accessories and other professional supplies. The seniors obtain practical experience in compounding of prescriptions for the University Health Service.—Several students have been permitted to register for graduate work while the Graduate Council is studying the proposed program offered in pharmacy for the Master's degree.—Teaching fellowships for the current semester have been granted to Loree Tindall and Frances Morter.—Torsion balances, sterilizers, a grinding mill, an autoclave, and filing cabinets are among the equipment obtained from the Army surplus supplies. A garden tractor has been purchased for care of the two acre medicinal plant garden. The University has appropriated \$9,000 for the purpose of equipping a new pharmacological laboratory.—During the second semester the student branch of the A.Ph.A. will sponsor a series of educational films dealing with public health and the health professions.—On January 9, the senior class gave a dinner in honor of Dean Emeritus W. F. Gidley. Dean Gidley was presented with a "slumber chair" by the students. A number of the staff members attended the function.

State College of Washington, School of Pharmacy.—Mr. John Y. P. Wu, a graduate of the department of pharmacy of the West China Union University, and a member of the teaching staff, is registered for graduate work with pharmacy as a major.—Two new laboratories, one for beginning pharmacy and the other for the study of proprie-

taries and crude drugs, are nearing completion.—Dr. A. I. White went to Washington, D. C., in October as a member of the Consultive Committee of Pharmacy Teachers of The Pharmaceutical Survey.—The local chapter of Kappa Psi is reorganizing under the leadership of Dr. Bang.—Rho Chi has recently elected three seniors to membership, and Lambda Kappa Sigma has initiated six new members.

Western Reserve, School of Pharmacy.—Dean Arthur P. Wyss is program chairman for the Northern Ohio Branch of the American Pharmaceutical Association.—At the December meeting Louis W. Yagle spoke on *A Time Saving Device to Aid in Making Percentage Solutions*, and Dr. S. M. Robbins, who has had much experience as chairman of the Committee of Pharmacology for the American Academy of Dental Medicine, spoke on *Pharmaceutical Service for the Dentists*.—At a meeting on January 9, the group was addressed by Dr. Edward C. Elliott, Director of The Pharmaceutical Survey.

University of Wyoming, School of Pharmacy.—The Eli Lilly Company has presented the school with an excellent display of the company's pharmaceutical products.—Dr. Daniel W. O'Day was the speaker at the October meeting of the Wyoming Section of the American Chemical Society. His subject was *Some Interesting Aspects of Synthetic Drug Chemistry*.—Dr. O'Day has been named a member of the Committee on Local and Student Branches of the American Pharmaceutical Association.—Prof. Tracey Call presented a paper on *The Effect of Igneous Activity on the Occurrence of the Rarer Elements* at the chemistry seminar being held during the present quarter.—A completely equipped and serviced instructor's laboratory desk has been installed in the pharmacy lecture room in Merica Hall.—Dr. Robert P. Fischelis, secretary of the American Pharmaceutical Association, was a campus visitor in October.—At the October meeting of the Pharmacy Club two scientific films were shown. The titles were *Electrons in Chemistry* and *Oxidation and Reduction Reaction*.

Temporary committees appointed by President Johnson for service at the 1947 Convention at Milwaukee, and the publication of which was overlooked in the October, 1947 issue of the Journal, are recorded below in order that the record may be complete:

Nominating Committee: Deans Rowe (chairman), Hall, and Hewitt.

Resolutions Committee: Deans Newton (chairman), Crossen, Tice, Jarrett, and Director Foote.

Auditing Committee: Deans Wyss (chairman), Hammond, and Goodrich.

Miscellaneous Items of Interest

Memorials

FREDERICK JOHN WULLING

"And that brings me to Minnesota. I met Minnesota abroad before I met her at home. The place was the convention room of a hotel. The hotel might have been any place in this broad land. The time was shortly after the turn of the century. A man, small of stature, serious and sincere in expression, friendly in disposition, with great dignity of bearing, fought with great courage and against great odds for a higher idealism in pharmaceutical education and practice. It was the germ of idealism that Frederick John Wulling planted in my soul that day, that has been my inspiration and guide through three decades of effort."

One decade has passed since I wrote those lines, and if I were to rewrite them now I would make but one change. I would insert in the last line the word **four** where the word **three** now stands. I shall make no attempt to catalog the accomplishments of Frederick John Wulling. They have long been recorded in the literature of our times, and they have been summarized in the various compendia that catalog the achievements of illustrious men. It is sufficient to say here that his interests were cosmopolitan and there is no human activity that has not felt either directly or indirectly the influence of his vigorous personality. That influence swept far beyond state and national boundary lines.

Dean Wulling was a fighter, and he fought irrespective of the odds that were against him or whether he had any one to support him at his side. Countless times I have seen him fighting, standing all alone. I like to remember him in that role. There is a grandeur about a man who is standing all alone, convinced that the cause for which he stands is just. I think the grandest moment in the life of Winston Churchill was when he stood all alone, his back against the wall, facing the enemy of civilization, unafraid. As a human being, I think the grandest moment in the life of Christ was when he hung on the cross, deserted and denounced by all the world as he cried in his lonesomeness, "Eli, Eli lama Sabachthani?" Such comparisons are neither non-reverential nor irreligious, for after His own image, God made man.

Dean Wulling was artistic. It made no difference whether he was planning his garden in the gentle days of spring or raking leaves in the mellow days of autumn, whether he was arranging a collection of historical clocks or displaying his works of art, whether he was entertaining his dearest friend or lambasting his most obstinate opponent, he did it always artistically and always with great dignity.

Dean Wulling was deeply religious. To him life was a serious business. He showed it in every act. He never let himself forget that he had a personal responsibility for his fellow man or for the generations of men yet unborn. By the manner of life, he preached. He taught by example. His concern was always for young men who were directing their efforts to a better way of life and to the improvement of our profession. After he retired from active administrative work he retained an abiding interest in everything that concerned the profession to which he had given his life. The advice and encouragement which he gave personally to men more actively engaged during this period was quite as effective as the service that he rendered at any previous time. Stowed away in my files are dozens of letters and post cards, often written from a bed of pain with a pencil when he could not manage a pen, but always pregnant with hope and always ending with the word that was characteristically Wulling,—“Cheerio!!!”—which to me meant not only a message of good cheer, but a shout of victory.

On Monday, October 20, 1947, Dean Wulling attended the monthly meeting of the Minneapolis Veteran Druggists Association, and from all appearances he was in his usual health. He was jolly and entered into the proceedings of the meeting with his usual enthusiasm and vigor. The afternoon of the following day was a delightfully mellow one. While Mrs. Wulling was preparing for a luncheon, Dean Wulling went out into the yard to absorb the sunshine and rake the leaves. After a short time Mrs. Wulling heard him call and found him lying in distress on the sofa in the parlor. Physicians were called, but within the hour Dean Wulling peacefully and triumphantly joined the immortals.

To Mrs. Wulling and to Emerson, the son, we extend our sympathy and beg to share their lonesomeness. But Dean Wulling would not have it so. From the green pastures and beside the still waters where he now walks and rests will come back the refrain—“Cheerio!!!” As long as memory lasts—so long will we remember and be grateful for the life of Frederick John Wulling.

Rufus A. Lyman.

GUSTAV BACHMAN

Gustav Bachman was an Austrian by birth. He came to America with his parents when he was but two years old. His parents, devout Mennonites, established their first home in Mountain Lake, Minnesota and later moved to a farm near Fulda. Dr. Bachman received his early training in the public schools in the communities in which he lived. He attended Macalister College (Presbyterian) in St. Paul and was graduated from the College of Pharmacy of the University of Minnesota in the first year of the present century. His outstanding personality, his character, and his student record led Dean F. J. Wulling to tender him an instructorship in the College of Pharmacy, which he accepted in 1902, and he became the first full time instructor in that institution. The administration of the University of Minnesota never had any occasion to regret Dean Wulling's choice for a companion to assist him in developing a great institution within a great university within a great state. Dr. Bachman was advanced through the various professorial ranks until he reached the full professorship status in 1919; and in this capacity he continued to serve until his retirement in 1946, when the Board of Regents appointed him Professor Emeritus of Pharmacy, and inscribed upon his citation was this statement: "You have contributed to the development of a great university, have enriched the lives of countless students and through them the life of the commonwealth."

Dr. Bachman spent his entire professorial life in one institution. He let no opportunity slip by to increase his knowledge and widen his experience. When traveling in Europe in 1914, he attended lectures given by men of renown, such as Thomas of Berlin and Tschirch of Bern. He was active in state and national association work and was a regular attendant at, and contributor to, the national conventions, and for ten years was a member of the National Formulary-Revision Committee, where he served with credit to himself and with distinction to his profession. Within his own state he made a large contribution to both professional and community life.

Throughout his life Dr. Bachman was active in the American Pharmaceutical and his own state association. He was a member of Acacia and an honorary member of Rho Chi and Phi Delta Chi. He was the first pharmacist to be appointed a member of a state board of health. He was first named to that position in Minnesota by Governor Benson. Governors Harold Stassen and Edward Thye not only reappointed him to that position, but openly commended him highly for his work. He was a director of the State Bank of Delano, Minnesota, a trustee of the Church of the Redeemer in Minneapolis; and his service to the Scottish Rite earned him recognition of Knight Commander of

the Court of Honor. For fifteen straight years he served his state association as its secretary without appreciable compensation—except the thanks and admiration of the membership. He knew personally practically every druggist in the state of Minnesota and had visited them in their stores. His personal influence and effort was a major factor in making that association what it is today.

Dr. Bachman retired from active duty on July 1, 1946, and he enjoyed his retirement to the fullest extent. He enjoyed good health, and he got around among his friends. Life for him was as full of joy and hope as ever.

On the evening before his death he complained of not feeling well and went up to bed early. When he came down stairs on the morning of November 11, he said he had slept reasonably well. He had breakfast with Mrs. Bachman. While she was busy with the after breakfast tasks he went to his room. Shortly after she called him and he did not answer. She opened the door, found him sitting in his chair. His head was resting on his chest. Dr. Bachman had passed on to a greater field of service.

Our loneliness will be assuaged by the memory of this gentle, dignified, warm hearted friend, who asked little and gave much, who was the essence of kindness and who left a trail of ideals to inspire and activate men to a more consecrated service. Gustav Bachman was always on the job. He was faithful to the end, and when the ferryman came for him he walked the gangplank without fear and with a knowledge that his job had been well done.

Rufus A. Lyman.

AGENDA FOR THE 1948 DISTRICT MEETINGS OF THE BOARDS AND COLLEGES

The following suggestions are submitted to aid in formulating an agenda for the 1948 meetings. It is suggested:

1. That an approximate amount of time should be allowed for the presentation and for the discussion of each topic.
2. That persons who are requested to make presentations be informed relative to the amount of time that has been allotted them.
3. That the allotted time be indicated on the program for the guidance of persons in attendance.

**SUBJECTS TO BE CONSIDERED FOR PRESENTATION
AND DISCUSSION**

1. The desirability of eliminating the use of graduated prescription bottles.

(A number of economic factors in addition to that of the accuracy of the graduations, are involved in this subject. Each Board of Pharmacy has received a communication from the Armstrong Cork Company relative thereto, and The N.A.B.P. has additional communications on the subject which will be furnished to whoever is assigned this topic, and obviously it should be presented by a Board member.)

2. A presentation and discussion pertaining to a model set of Board of Pharmacy records and forms to be used as a pattern for Boards to adopt and thereby enable them to make accurate and regular compilations of vital and necessary census and licensure data without undue burden or delay.

(The writer will undertake to present this subject and include all material that has been referred to and approved by a special N.A.B.P. committee for this purpose. This committee and their assignment were proposed by N.A.B.P. President Frank W. Moudry, a member of the Pharmaceutical Survey Committee and Dr. Edward Elliott, Director, The Pharmaceutical Survey, who has frequently stated that the Boards and Colleges were not keeping accurate records.)

3. A presentation on Board examinations.

(I had hoped to acquire a small pool of questions from which a set that was deemed to be modern and suitable could be presented and discussed relative to merit. The N.A.B.P. has a Committee on Board examinations, the chairman of which is Dr. A. B. Lemon, University of Buffalo, School of Pharmacy, Buffalo 14, New York. He has made several presentations at District No. 2 meetings and to the New York Board of Pharmacy, of which he is a member. He has indicated that the New York Board would have no objections if the N.A.B.P. Districts wished to consider a report on what is going on in New York relative to the matter of licensure examinations. I believe that anyone who is assigned this subject to present should review the New York material and also refer to:

- N.A.B.P. Proceedings for 1938, pages 15-29.
- N.A.B.P. Proceedings for 1942, pages 86-92.
- N.A.B.P. Proceedings for 1943, pages 82-90.
- N.A.B.P. Bulletin for January, 1944, pages 2-3.
- N.A.B.P. Bulletin for February, 1944, pages 4-5.

4. Limitation of enrollments of students in colleges of pharmacy. (In view of communications received by the A.A.C.P. and N.A.B.P. from Dr. Edward C. Elliott, Director of The Pharmaceutical Survey, the A.A.C.P. has urged that this subject be again presented, preferably by a member of the A.A.C.P. Executive Committee who is located in the District and is familiar with the facts that occasion the need for further attention to this matter.)
5. Methods and measures recommended for selection of students who seek to enter colleges of pharmacy. (This subject is also proposed by the A.A.C.P. as one which ultimately affects licensure and should be presented by someone having a good understanding of methods and their application, preferably a faculty member.)

P. H. Costello, Secretary,
National Association of Boards of Pharmacy.

PHARMACEUTICAL SURVEY CURRENT

No. 16

October, 1947

MEMBERS OF THE COMMITTEE ON THE PHARMACEUTICAL SURVEY:

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October Optimum

The stuff of The Survey definitely began to "jell" during the month. This was clearly evident during the two-day session of the Committee in Washington on October 7-8. Certain of the important matters discussed and acted upon were publicized through the press release which was widely distributed. However, it may be known that other even more significant matters were before the Committee for preliminary consideration. Anyone doubting the serious intentions of The Survey would have realized the determination of the Committee to spearhead new columns for the stability and advancement of the profession.

Teaching Staff Needs

As a result of the Committee discussion of the existing critical situation due to the lack of teachers for the colleges, The Survey sent a "Rush" request to the deans on October 9, for definite information as to present needs and estimated needs for the immediate future. The responses came promptly. 61 colleges reported 99 staff members now

needed and 148 additional needed during the coming three years. These figures make a weak link in the chain supporting the structure of professional training. There's a job ahead to forge a new and stronger link.

Retail Pharmacy

A meeting of the Subcommittee set up with the cooperation of the N.A.R.D. was held in Chicago on October 13. Plans were completed for tapping the minds of 1,000 retail druggists throughout the country. The inquiry sheets will be distributed the first week of November. In this connection the Secretaries of the State Associations have given invaluable assistance in the selection of druggists.

Curricular Studies

The subcommittees organized by Dr. L. E. Blauch have been in session in Washington this month. That on Pharmacy (W. Paul Briggs, Veterans Administration; Louis W. Busse, University of Wisconsin; Allen I. White, State College of Washington; and Louis C. Zopf, State University of Iowa) met during the week of October 20; and that in Pharmacognosy (J. Hampton Hoch, Medical College of the State of South Carolina; Arthur E. Schwarting, University of Nebraska; Ralph F. Voigt, University of Illinois; and H. W. Youngken, University of Washington) met during the week of October 27.

It is anticipated that these committees will be able to set a new pattern for the organization of curricular material.

Survey Report

Not a day passes but someone asks how soon the report of The Survey is to be available. The best projection that can now be made is June, 1948. Nevertheless, some of the major outcomes will be known and published shortly after the New Year. The character and extent of the published report will be determined by the spiraling costs of printing.

End Paragraph

This issue of the Current is somewhat abbreviated. A dozen pages would be required to journalize the daily happenings. But those of the staff in charge of the processing of The Survey data tell me emphatically that the machinery is already carrying a heavy overload. So the flow of the Current will need to be reduced. In spite of this, it should be known that each day there is proof of the widening interest throughout the pharmaceutical republic in the activities of The Survey. Would that we had the means, the time, and the wisdom to examine

into the scores of problems being submitted by pharmacists who have an awareness that a decade of destiny for the profession is ahead.

Edward C. Elliott, Director.

PHARMACEUTICAL SURVEY CURRENT

No. 17

November, 1947

MEMBERS OF THE COMMITTEE ON THE PHARMACEUTICAL SURVEY:**November Nutrition**

In spite of meatless Tuesdays and eggless Thursdays, most of the month was given to the business of ingesting and digesting some of the meaty and eggy portions of the hoarded stock of the facts of pharmacy. From the beginning, it has been emphasized over and over that we are to get the facts. This has been a tedious, time-consuming, and oft-times fruitless, task. The real difficulties now appear—to determine the meaning, worth, and interrelations of the facts; and to devise ways and means for using the facts for the making of constructive programs of action for the future. But few of the facts we have are new. The vitality of these facts will present numerous problems to test the wisdom, foresight, and courage of the Committee. When The Survey has ended, there will be a temptation to prepare an essay, under the title, "The Catalysis of Facts," with special attention to human beings.

Retail Pharmacy

The forms for the special inquiry into the major problems of retail pharmacy, referred to in The Survey Current for October, were distributed to one thousand operators. The number and completeness of the responses already in is most gratifying. It appears that a gold mine—or should be say a uranium mine—of critically important information is being opened.

The December Meeting

As might be expected, the chief activities of the staff have been directed during the month to the preparation of material for the consideration of the Committee at the meeting scheduled for December 8 and 9. The agenda for the meeting provides for the discussion of the following special reports (Committee Transmittals):

- No. 7 (Dean's Comments re Syllabus)
- No. 8 (Needs of Colleges as reported by Deans)
- No. 10 (Scholarships and Fellowships)

- No. 11 (Student Enrollment Data, October, 1947, and Relation of Estimated Supply and Demand, 1948)
- No. 12 (Estimated Staff Needs)
- No. 13 (Staff Supply)
- No. 14 (Staff Data re Salaries and Degrees)
- No. 15 (Faculty Statements of Problems of Pharmacy)
- No. 16 (Women in Pharmacy)
- No. 17 (Recommendations on Continuing Predictive Testing^{*} Program)
- No. 18 (Elliott Memo No. 3 to American Council on Pharmaceutical Education relative to accrediting standards and procedures)
- No. 19 Actuarial Analysis of the Aggregate Withdrawal Rate of Pharmacists.

Curricular Studies

Dr. Blauch has been engaged in the preparation of the reports of the Subcommittees on Pharmacy and Pharmacognosy. Plans for the organization of a Subcommittee on Pharmaceutical Economics are now under way. The work of this Subcommittee, to be composed of representatives of the colleges and of business, promises to be far-reaching.

State Boards of Pharmacy

Mr. Wood has completed the first draft of his study of the organization and operation of the State Boards of Pharmacy. An important section of this report will deal with the so-called practical experience requirement for licensure. A special inquiry relative to this was sent to the Secretaries on November 25th.

National Association of Retail Druggists

Those receiving the Current will be interested in reading the resolution relative to The Survey, adopted at the recent Chicago Convention of the N.A.R.D., and appearing in the November 3rd issue of the N.A.R.D. Journal (pp. 2002 and 2008); also the address of the Director of The Survey, to be found in the *Journal* of November 17th (pp. 2158 and 2159).

Jottings: Things That Were and Are To Be

November 11—Assistant Director J. S. Mordell addressed the Pharmacy Section of Maryland-District of Columbia Hospital Association in Baltimore.

November 24—Meeting of the Subcommittee of the Committee on The Pharmaceutical Survey (DuMez, Christensen, Swain) with the Executive Committee of The American Foundation for Pharmaceutical Education.

December 5-6—The Director to attend the meeting of the Executive Committee of the A.A.C.P. in Columbus, Ohio for consideration of certain of the proposed implementation phases of The Survey.

December 10—The Director to address the joint meeting of the Pharmaceutical Association and Medical Association of the District of Columbia upon the mutual problems of pharmacist and physician.

The Long Way Around And the Shortest Path Home

Recently the Editor of one of the leading pharmaceutical journals recorded disappointment that The Survey had not yet made public its findings and recommendations. This prompts the observation that the conclusions of The Survey will be those approved by the Committee on The Pharmaceutical Survey, and this Committee is going to insist on having full opportunity to weigh all of the available, essential facts before reaching any of its decisions. More than a whistle is required to get the facts. Much more than a whistle will be needed to cause the facts to jump through the hoop of action.

Edward C. Elliott, Director.

PHARMACEUTICAL SURVEY CURRENT

No. 18

December, 1947

MEMBERS OF THE COMMITTEE ON THE PHARMACEUTICAL SURVEY**The Shortest Days of the Year**

Decembers are usually months of work discontinuation, and December of 1947 was no exception. The first ten days were consumed by meetings, all of which had worth for the purposes of The Survey. Then followed the succession of pre, pro, and post-holiday operations.

On December 5 and 6 the Director was privileged to attend the meeting of the Executive Committee of the A.A.C.P. at Columbus, Ohio. Here there was full and frank discussion of matters of importance to the Association, and hence to pharmacy. Of these the proposal relative to the conduct of seminars for teachers of pharmaceutical subjects, during the summer of 1948, occupied first place. The constructive

action of the Executive Committee was encouraging and reflected the pioneering courage of the Association. Before this is read the members of the Association will have received from Dean Christensen, the Chairman of the Subcommittee created, the announcements as to the initial plans for putting the proposal into effect.

December 8 and 9 were given to the meeting of the Committee on The Pharmaceutical Survey. All fifteen members were present, which evidenced the significance of The Survey to this group of leaders in pharmacy. The press release of December 12 summarizes the proceedings of the Committee. The next meeting will be held on February 2-3, 1948.

The Drug Trade Conference met on December 10, and provided an exceptional opportunity for the Director to indicate and to emphasize some of the chief objectives of The Survey to a group of those who have proven their leadership in advancing the causes of pharmacy. It is timely that the two resolutions adopted by the Conference should be widely known and applauded:

Cooperation with Pharmaceutical Survey

RESOLVED by the National Drug Trade Conference that it records its approval of the aims and purposes of The Pharmaceutical Survey, and that it expresses its willingness to cooperate in the implementation of its recommendations so that The Survey may achieve, in large measure, the objectives for which it was intended.

American Foundation for Pharmaceutical Education

WHEREAS, the American Foundation for Pharmaceutical Education has done most constructive work in aiding colleges of pharmacy and students therein and in supporting The Pharmaceutical Survey under direction of Dr. Edward C. Elliott, and **WHEREAS**, it has been set forth by Director Elliott of The Pharmaceutical Survey that the most urgent need of American Pharmacy today is for an adequate supply of properly trained teachers and research workers for our colleges of pharmacy and pharmaceutical laboratories, and

WHEREAS, teachers and research workers in the field of pharmacy are provided by our graduate schools offering graduate work leading to the Ph.D. Degree in pharmaceutical fields, and

WHEREAS, approximately three years or more of training at the graduate level at a cost of approximately \$2,500 per man per year is necessary in order to produce qualified teachers and research workers, and

WHEREAS, the Foundation is endeavoring to secure adequate funds to underwrite from 75 to 100 Fellows for graduate work in the field of Pharmacy during the coming year;

THEREFORE, BE IT RESOLVED that the National Drug Trade Conference urges all drug manufacturers, wholesalers and retailers to give maximum financial support to the Foundation in the campaign which it is now conducting in order that sufficient funds may be available to support an adequate number of Fellows to supply the urgent demand for teachers and research workers.

"Some Observations of the Physician-Pharmacist-Public Triangle" was the title under which the Director spoke at the joint meeting of the District of Columbia Pharmaceutical Association and the Medical Society of the District of Columbia on December 10. Some of the data developed from the inquiry recently sent to a thousand retail druggists throughout the country furnished some lively stuff for discussion.

The Survey Findings and Recommendations

The marshalling of the multitudinous facts about pharmacy continues. At certain points columns have been formed preparatory to the drawing of conclusions and the making of recommendations. Whether these recommendations will be made known to the profession as they are agreed upon by the Committee, or presented in one publication will need to be decided at the February meeting.

January Prospect

The growing country-wide interest in The Survey is proven not only by the mounting daily mail, but by the frequent calls to the Director to appear at meetings of various pharmaceutical organizations. It is to be regretted that the duty demands at headquarters makes it impossible to undertake all of the demanded travel and talking. Looking over the calendar indicates that there are these outside performances for January:

January 9—Cleveland, Ohio. Northern Ohio Branch of the American Pharmaceutical Association.

January 14—Chicago, Illinois. Rho Chi Society, College of Pharmacy, University of Illinois.

January 22—Hartford, Connecticut. Annual meeting of the Connecticut Pharmaceutical Association.

To Survey and Survive. That is the question.

Edward C. Elliott, Director.

THE PHARMACEUTICAL SURVEY

Press Release No. 10

December 12, 1947

The Committee on The Pharmaceutical Survey held its sixth meeting on December 8 and 9, 1947, in Washington, with all fifteen members present. During five sessions, the Committee reviewed the reports on a number of The Survey projects presented by Director Elliott. Among these were reports on predictive testing of students, scholarships and fellowships, place of women in pharmacy, supply and salaries of pharmacy teachers, rates of withdrawal of pharmacists from active service and the relation of these rates to the estimated supply of licensed pharmacists.

Special attention was given to the current enrollment in 65 accredited pharmacy colleges, now totalling more than 18,000 undergraduate and more than 300 graduate students. This is a 20 per cent increase over the 1946 autumn enrollment. These figures confirm the Committee's action of October, 1947, in alerting the schools and boards of pharmacy to the need for careful adjustment of student admissions in order to avoid a probable oversupply of pharmacists, beginning not later than 1951.

Information supplied by 62 colleges of pharmacy indicates that there are 99 unfilled positions on their teaching staffs. During the coming three years, it is estimated that 152 additional staff members will be needed. Ways and means for securing a dependable supply of teachers of pharmaceutical subjects were proposed.

Statements submitted by the faculties of a number of institutions concerning the problems of the profession were considered. These statements will supplement the information gathered from other segments of the profession to form a representative picture of the thinking of those actually engaged in the various branches of pharmacy. Recently an inquiry form, covering a wide range of questions on daily retail practice, has been sent to 1,000 retail pharmacists throughout the country. An important section of this inquiry is concerned with the relationship of pharmacy to medicine.

Clearance was given to various proposed tabulations to be incorporated in the prescription study and for the final publication of the entire study. Steps taken with respect to reorganization of the pharmaceutical curriculum were reviewed.

The plan and form of publication of the final report, to be released during the early summer of 1948, were discussed.

The next meeting of the Committee will be held February 2-3, 1948, at which time announcement will be made regarding the first of the findings and recommendations of The Survey.

REPORT ON MEDICAL SCIENCES SECTION, PHARMACY
SUBSECTION NP, OF THE AMERICAN ASSOCIATION
FOR THE ADVANCEMENT OF SCIENCE

The Pharmacy Subsection of the Medical Sciences Section held three sessions during the Chicago meeting in December, 1947. The sessions were well attended by representatives of the pharmaceutical industry, departments of pharmacology in medical schools, and representatives from the various areas of science in schools of pharmacy.

H. W. Youngken and Wm. E. Hassan, Jr., reported that the Camphor Basil, *Ocimum kilmandscharicum*, a shrubby plant native to Kenya, British East Africa, has been grown successfully as an annual in the Boston area. A detailed description of the cultivated plants grown in the Medicinal Plant Garden is given. The dried leaves and flowering tops harvested in late October yielded an average of 2.5 per cent of oil and 2.54 per cent of camphor, the latter similar to the camphor from the Camphor Laurel of Japan and China.

E. R. Kirch, O. Bergeim, J. Kleinberg, and S. James carried out experiments under conditions of artificial gastric digestion to show the influence of various foods on the reduction of iron. It was found that fresh fruits and vegetables reduced iron as much as 77-98 per cent, largely due to the ascorbic acid content. Egg white, meat and bread reduced iron to the extent of 25-40 per cent, while milk and egg yolk gave practically no reduction. It is believed in general that the iron utilized by the animal organism has to be in the reduced or ferrous state in order that it may be utilized and absorbed to a maximum.

R. H. Blythe, J. J. Gulesich, and H. L. Tuthill described new and modified *in vitro* tests based on physico-chemical principles devised for the evaluation of hydrophilic laxatives. These tests measure swelling, water uptake and water retention in artificial gastric and intestinal media. *In vivo* conditions are further stimulated by a novel use of Carbowax as an osmotic agent; in this test, the gel formed by letting the substance swell in artificial intestinal fluid, is subjected to the pull of a 30 per cent solution of Carbowax "4000" through a "600"-grade cellophane membrane. This osmotic effect was selected as giving an indication of hydrophilic properties of the agent under the physiological conditions which exist in the colon. These tests were applied to commercial preparations of karaya and psyllium and to the synthetics, methylcellulose and sodium carboxymethylcellulose. The cellulose derivatives were found to be generally superior to the gums in hydrophilic properties, in addition to having the advantages of greater uniformity and stability.

C. C. Pfeifer gave the result of work in which he attempted to answer why a particular type of chemical structure, or more important, why unrelated types, have the same specific pharmacological action of particular types of reactive cells. Previous hypotheses based on the known ring systems of organic chemistry have been inadequate. Greater correlation is obtained by modeling the morfulas in three dimensions, determining the active prosthetic groups and the critical or optimal interprosthetic distance lineally. Atomic measurements of acetylcholine and its aliphatic homologues are in accord with the postulate that three receptors on the cell surface are activated by a double oxygen prosthetic group and a methyl on nitrogen prosthetic group at an interprosthetic distance of approximately 5 angstra. The nature of the oxygen prosthetic groups may be ester, ketone, ether, or hydroxyl. The closed ring structure of pilocarpine, arecoline, neostigmin or physcetigmin have these three prosthetic groups at approximately the same interprosthetic distance as in acetylcholine. Potency of the quarternary analogues of neostigmin may be correlated with the optimal interprosthetic distance. Potent blocking molecules which are close analogues of atropine have an identical spacing of the three prosthetic groups contained in a large umbrella molecule which in some unknown manner blocks the receptors on the cell and perhaps adjacent receptor groupings.

K. P. DuBois told of his researches on the new rodenticide known as Castrix. This investigation has shown that Castrix is about 5 times more toxic to rats than the war-time discoveries known as 1080 and ANTU. It is readily acceptable to rats and highly toxic when offered at a concentration of 1 per cent in the diet. Castrix produces convulsions and death in about 30 minutes after lethal doses are eaten. Sodium phenobarbital (Nembutal) was found to be a very effective antidote for Castrix poisoning.

Particular interest was evidenced in a series of papers on the use of radioactive tracer compounds. Dr. John E. Christian pointed out that radio-active elements have possibilities for direct application in therapeutics but their greatest interest in pharmaceutical research is as tracer elements. Because a radioactive isotope of an element behaves identically with other isotopes of that element in all chemical and physiological properties, it labels without question the particular atoms one wishes to trace. In other words, the labelled atoms are ultimately specific for tracing any element. The extreme dilutions in which it is possible to trace such tagged atoms makes it possible to undertake studies hitherto impossible. For example, one may study and determine accurately the rate of absorption of certain substances and the degrees of irritation on the skin or mucous membrane, the time and rate of disintegration of enteric coated tablets, the distribution of drugs into

certain organs and tissues, the rates of excretion and the route of excretion. This new tool should make it possible to greatly extend our knowledge of the mechanism of drug action and from that knowledge we should be able to devise better drugs.

The removal of calcium and phosphorus from teeth by mouth washes, fruit juices, and similar substances has received considerable attention in the scientific press during the last few years.

Jarvis, Edwards, Christian and Jenkins showed that when a rat was injected with radioactive phosphorus, the rat's teeth became radioactive. The effect of various substances on the removal of the radioactive phosphorus from the rat's tooth was then studied. They showed that the pH of the solution of a mouth wash or fruit juice has little effect upon phosphorous depletion of the teeth. Distilled water removed much more phosphorous than did ordinary tap water or the usual mouth washes. Lemon juice was found to be the most active of all the substances tested in removing phosphorus from teeth.

R. K. Thomas, J. E. Christian and L. D. Edwards determined the residues of applied phospholipids and sodium n-alkyl sulfates on the rat skin using radioactive tracer substances. They found that this technique very well evaluated the amount of such residues remaining after application in the form of a soap and rinsing with water. In a series of sodium n-alkyl sulfates the residues remaining on the skin after rinsing and drying were greatest with those compounds whose chain length was optimum for surface activity, namely 12 carbon atoms. They found that the amount of phospholipid in a so-called superfatted soap remaining on the skin after application in soap and then washing was almost insignificant.

Glenn L. Jenkins, Chairman.

NEW BOOKS

The Dispensatory of the United States of America, by Arthur Osol, Ph.G., M.S., Ph.D., Professor and Director of the Department of Chemistry, Philadelphia College of Pharmacy and Science, and George E. Farrar, M.D., F.A.C.P., Associate Professor of Medicine, Temple University, Chief of Medical Service A, Episcopal Hospital. Advisory Editor, Horatio C. Wood, Jr., M.D., PhM., Professor of Pharmacology, Philadelphia College of Pharmacy and Science; Vice-President of the U. S. Pharmacopoeial Convention. 1947. The 24th Edition. 1928 pages. J. B. Lippincott Company. Price \$16.50.

Through the 115 years of its publication, edited and authored by the best qualified and progressive men in their respective fields, the "United States Dispensatory" has become a medico-pharmaceutical classic, a MUST in every library, drug store, and physician's office, and every place where a complete reference is needed. It has become to those engaged in any field related to the health sciences what Webster's Unabridged Dictionary has to the lay public. The plan to present reliable information about all new drugs and new information about old drugs in each edition has been adhered to in the present edition. A new feature is a more extensive discussion in each monograph of the therapeutic use, the dosage and the precautions to be taken in administration. This is of the upmost importance in these days of rapid synthetic drug production. The name of the manufacturer is given, and the trade name or trade-mark is discussed in each case, which enables the physician and the pharmacist to locate the commercial source. The drugs in the latest official compendia, the "New and NonOfficial Remedies", the last "British Pharmacopoeia" and its addenda are covered. A new section has been introduced covering the veterinary uses and doses of drugs and veterinary biologicals. This is most timely in view of the ever-increasing importance of this field to the practicing pharmacist. The publishers are to be commended on maintaining the high mechanical standard of the publication. Books of this type receive such hard and constant usage that they need to be well made.

R. A. L.

400 Years of a Doctor's Life, by George Rosen, M.D., and Beate Caspari-Rosen, M.D. 1947. 429 pages. Henry Schuman, New York. Price \$5.00.

A remarkable production in which the traditional role of doctor and patient are reversed. You examine the doctor; the doctor does not examine you. It is a collection of extracts from the best autobiographies of distinguished physicians, men and women, some well known to the general public, others not so known—covering the period from the 16th century to the present time, selected, collected and arranged by two distinguished medical historians who are themselves doctors. The selections are arranged by chapter to cover various periods of the doctor's life and activities and philosophy. The titles of the ten divisions are: Early Years; School Days; The Medical Student; The Practice of Medicine; Scientist, Scholar, Teacher; The Doctor Marries; The Doctor as Patient; The Doctor Goes to War; Writing and Politics; Reflections on Life and Death. It is not a book for doctors alone. The peek that the book gives into the lives of doctors is just as stimulating, just as fascinating, and just as helpful to men and women in any professional field or, for that matter, to the layman as well. Here is a book that should be read by every pharmacy

student, every pharmaceutical educator, every practicing pharmacist, and every pharmaceutical industrialist. It will help every one to better understand and appreciate people, and what is more important, it will help him to grasp the significance of what is taking place in his own life and better understand himself.

R. A. L.

American Pharmacy Volume II, Advanced Pharmacy; Medical, Surgical and Dental Supplies; Animal Health Pharmacy, by Rufus A. Lyman, M.D., Director School of Pharmacy, University of Arizona, Editor-in-Chief; and George Urdang, Ph.G., D.Sc.Nat., Technical Editor, Director, American Institute of the History of Pharmacy; with the aid of six advisory editors and eighteen authors, specialists in their respective fields. 1947. 111 illustrations, 379 pages, J. B. Lippincott Company. Price \$7.00.

This text is intended to follow any text which covers the fundamental principles of pharmacy and the study of pharmaceutical preparations. It covers those subjects which are not taken up in the basic course but which the student must be thoroughly grounded in before undertaking courses in dispensing. The text is divided into two parts. Part One includes flavors and their pharmaceutical application; coloring agents; odors and deodorants; solvents used in pharmacy and industry; extraction of animal tissues and fluids; some properties of aqueous solutions and their application to pharmacy; parenteral preparations; colloids, emulsions and suspensions; the manufacture of tablets. Many of the chapters have been written with the thought in mind that they will stimulate the student and direct him to larger fields of endeavor. Part Two includes chapters on special diet foods; surgical appliances; surgical dressings and related supplies; rubber goods; sutures; sickroom supplies; consumer dental products; animal health pharmacy. This is a field that has not been previously covered in textbook form—yet it includes material of the greatest importance to the student in the study of dispensing and to the practitioner in handling this type of merchandise. The authors have confined their discussions to basic principles involved. For example, in the chapter on surgical appliances the author has described the structures involved in the weakened body wall, the pathology resulting as a result of the changes and the principles involved in giving support. This is what is needed for intelligent service. Various types of support are illustrated, but no attempt is made to picture a surgical catalog which is an ever-changing document. The mechanical work in the text is excellent—the drawings and illustrations are clear and accurately done.

It affords an opportunity to the student to obtain a background enabling him to more intelligently discuss pharmaceutical problems of compounding and dispensing with the physician.

B. A. B.

Pharmacology and Experimental Therapeutics, A Survey for 1941-1946, by Hamilton H. Anderson, Professor of Pharmacology and Experimental Therapeutics, University of California; Benedict E. Abreu, Assistant Professor of Pharmacology and Experimental Therapeutics, University of California; and Fumiko Murayama, Research Associate in Pharmacology. 1947. 368 pages. The University of California Press. Price \$6.50.

The publisher has made an excellent and complete statement of the coverage and the objective of the survey as follows: "This Survey brings together significant studies in the field of applied pharmacology and toxicology. It summarizes wartime developments in the discovery of new medicinal agents and new uses for existing drugs. Quantitative data only are included, in an effort to relate dosage to specific effect. Whenever blood or other tissue levels of an effective agent are reported, these are listed. Each medicinal agent is recorded under its accepted name, and whenever synonyms or chemical names are known, they are given. In vitro effects and in vivo activities in the several species and especially in man are summarized. Beneficial as well as harmful effects produced by known amounts of biologics or chemicals are recorded briefly. Biologic tests used to identify agents, and chemical technics utilized for detecting important drugs or poisons in body fluids or tissues, are listed also. Under each agent included in the survey there is first noted the species, or, if that terminology is not applied, then the technic for identification or other test or characteristic; second, the effect produced; third, the dose level (in mgm. per kilo whenever given); fourth, other data on the effects produced, whether beneficial or harmful; fifth, the author, reference source, volume of journal, page, and year of publication. Since no effort has been made in recent years to record poisoning resulting from exposures to new industrial or agricultural agents, or even medicinals, references in this area are included. A conscientious effort has been made to cover not only medical literature, but also the literature of experimental biology, veterinary medicine, dentistry, pharmacy, and the related specific fields as well. "Pharmacology and Experimental Therapeutics" is a valuable reference guide for doctors, laboratory research workers in educational and industrial fields, teachers, and graduate students."

The publication of the Survey was made possible through the generosity of Dr. Langley Porter, former Dean of the School of Medicine of the University of California. His suggestion resulted in the establishment of the W. W. Crocker Fund which financed the publication. Any monies received from the sale of the book will be used to finance future surveys; a most commendable policy.

R. A. L.

Pharmacognosy, by Edmund N. Gathercoal, Ph.G., Ph.M. Emeritus Professor of Pharmacognosy, University of Illinois, College of Pharmacy; Ex-member of the U.S.P. Revision Committee and Emeritus Chairman of the National Formulary Committee; and Elmer H. Wirth, Late Professor of Pharmacognosy and Pharmacology, University of Illinois, College of Pharmacy; Dean of the University of Illinois Drug Plant Experiment Station; Vice-Chairman, National Formulary Committee; Member U.S.P. Revision Committee. 1947. Second Edition. Thoroughly Revised. 372 illustrations and 3 colored plates, 756 pages. Lea & Febiger. Price \$10.00.

The authorship and the First Edition guarantee the excellency of the Second. The text is so well known that little needs to be said here. As the authors state, the First Edition was based upon Kraemer's classical work. In the present Edition new items have been added and the obsolete items have been deleted. The chemistry of drugs has been stressed, and the discussions of drug plant culture, preparation, storage and drug analysis have been enlarged. In each monograph the complete official history of the drug has been substituted for the original official status, and repetition of printed matter found in the official compendia has been deleted. The authors have made an effort to improve the work as a teaching text and yet preserve its usefulness as a book of reference. This is not always an easy thing to do, but they have done well. The illustrations are excellent and so is the mechanics work of the publishers.

R. A. L.

The Law of Drugs and Druggists, by William H. Arthur, Professor of Law, University of Kansas City; formerly Charles Inglis Thompson Professor of Law, University of Colorado, 1947. Third Edition. 702 pages. West Publishing Company, St. Paul. Price \$5.00.

This text was begun many years ago in collaboration with Dean Homer C. Washburn of the University of Colorado, and the First Edition appeared in 1935. The purpose was to collect and arrange in the logical form and discuss the multitude of laws which surround the druggist for the protection of both druggists and the public, presenting situations which may lead to legislation. Since the first edition appeared a war has been fought and the federal narcotic laws have been revised and extended, which has resulted in the adoption of new and the revision of old state laws and municipal ordinances. The Third Edition has been modified to meet these changed conditions, and the subject matter has been presented in a way most useful to the pharmacy student, the practicing druggist, law enforcement offices, and the pharmaceutical industrialist. The author begins the text with a historical introduction. Part I covers state and local laws and includes the discussion of

such problems as the functions and powers of boards of pharmacy, druggists' liabilities for errors of employees, specific problems of the retail druggist, intentional misuse of drugs, and price fixing and restraint of trade. There are 27 chapters which cover practically every phase of the druggists' and manufacturers' liabilities. Part II deals with the federal statutes and regulations and covers the Federal Food, Drug and Cosmetic Act, the Wheeler-Lea Act, the Insecticide Act, and the Postal Regulations. There are four appendices. Appendix I is a Glossary which is of special value because it defines the technical terms in the legal language, which are often meaningless to the layman. Appendix 2 defines the function of the various courts, reports, statutes and common law. Appendix 3 defines the Uniform Narcotic Act, and Appendix 4 clarifies the Federal Caustic Act. The text is indispensable to the pharmacy student and to any one engaged in any phase of pharmaceutical work where legal knowledge is involved—and that means to the whole drug industry.

R. A. L.

AN APPRECIATION

For the eleventh successive year Prof. Zada M. Cooper has prepared the index for the annual volume. With each passing year the Journal has increased in size, and the task of indexing has been a larger one. Although Miss Cooper's days are filled with other duties, she has always cheerfully and happily continued to make this contribution to the work of the Association to which she has already given so much time and service, and for which we are eternally thankful.

Rufus A. Lyman, Editor

The Editor has just received the fall number Volume II, 1947, of the "Hebrew Medical Journal", which is celebrating its twentieth anniversary. It is a semi-annual, bilingual publication edited by Moses Einhorn at 983 Park Avenue, New York. This issue gives an excellent picture of health conditions in Palestine. An article of special interest to pharmacists deals with the pharmacology and toxicology of streptomycin, by Ernst Pick; and under the heading, *Historical Medicine*, Dr. Leon Nemoy of Yale University writes on the great philosopher and the physician of the thirteenth century, Ibn Kammuna; and Dr. Yom-Tov Levinson in his article on *Folklore Medicine*, discusses the legends surrounding frogs and spiders as healing agents.

There has been some confusion as to the status of pharmacists who have been in the service of the Veterans Administration for a considerable length of time and do not hold the Bachelor's degree. To clarify this situation a conference was arranged recently with Dr. W. Paul Briggs, Chief of the Pharmacy Division of the Veterans Administration, by the representatives of the American Society of Hospital Pharmacists. Those attending the conference included Major Arthur Einsbeck, Dr. Robert P. Fischelis and Mr. George F. Archambault of the U. S. Public Health Service. The following information was developed, which seems to show the advancement of pharmacy in the services will not be interfered with and the provision for the advancement of those already in the service is fair and equitable.

1. Veterans Administration pharmacists with permanent Civil Service status as of January 3, 1946, were transferred in grade to the new Department of Medicine and Surgery of the Veterans Administration. Thus, their grade and permanence were protected by Public Law 293. This means that pharmacists who have permanent Civil Service status in any of the professional classifications, will retain that status whether they are Bachelors of Science in Pharmacy or not.
2. Pharmacists in the Veterans Administration with a Civil Service status other than permanent, may not reach a permanent status in the classification which they now hold, if such pharmacists are not in possession of a Bachelor of Science degree. The status of this group depends upon the general employment situation and the requirements of the Service.
3. New appointments as pharmacists in the Veterans Administration will be made from applicants who possess the necessary qualifications for admission, which include the Bachelor of Science degree.
4. The Congress having established the Bachelor of Science degree as the desired minimum educational standard for pharmacists and the Administrator having determined that experience cannot fulfill the intent of Congress, the Bachelor of Science standard must prevail for appointment purposes. Under Civil Service policy all promotion standards must be identical with appointment standards. While persons who are already employed under permanent Civil Service will not be affected by the Bachelor of Science requirement as far as the security of their status is concerned, their advancement will be limited to in-grade promotion. Annual in-grade salary increases rise to the amount of the base pay of the next higher grade.

Scholarships, fellowships and graduate assistantships have been reported to the Editor as available in the pharmaceutical sciences for the academic year 1948 and '49 as stated below. For detailed information application should be made to the dean of the respective institutions.

University of Florida.—Several good graduate fellowships, averaging from \$750 to \$1,800, requiring various amounts of service by departments in which the fellowships are held.

University of Iowa.—A number of scholarships and assistantships on both the undergraduate and graduate levels.

University of Minnesota.—Eighteen fellowships and graduate teaching assistantships requiring various services. The stipend varies between \$500 and \$1000 for varying amounts of time.

University of Nebraska.—Five graduate assistantships of \$750 each and one fellowship of \$1000.

University of North Carolina.—Four teaching assistantships and five research fellowships ranging from \$600 to \$1,000 with tuition exemption.

The officers-elect of the American Society of Hospital Pharmacists are as follows:

President-Elect.....	W. Arthur Purdum, Baltimore Md.
Vice President-Elect	Geraldine Stockert, Long Branch, N. J.
Secretary-Elect	J. R. Cathcart, West Chester, Pa.
Treasurer-Elect	Sister Jeanne Marie, Youngstown, Ohio

The officers elected will be installed at the annual convention to be held in San Francisco the week of August 8, 1948.

The membership also voted to amend the Society's Constitution and By-Laws to change the title "Chairman" to "President" and "Vice-Chairman" to "Vice-President."

The present officers of the American Society of Hospital Pharmacists who will continue to function until the San Francisco convention in August are:

President.....	John J. Zugich, New Haven, Conn.
Vice-President.....	Margaret S. Gary, Norfolk, Va.
Secretary	Leo F. Godley, New York City
Treasurer	Sister Etheldreda, New York City

Dr. George L. Webster, University of Illinois, has been elected, by mail vote, president of Rho Chi, national pharmaceutical honor society. He will assume office at the 1948 meeting at San Francisco and will succeed Dr. T. D. Rowe, of Rutgers University, who is the present president. Other national officers now serving are Dr. Harold Werner of the W. S. Merrill Company, vice-president; and Dr. R. A. Bowers, University of New Mexico, secretary-treasurer. Council members are Dr. J. Allen Reese, University of Kansas; Dr. P. H. Dirstine, Washington State College; Dr. George E. Crossen, Oregon State College; and Dr. Karl J. Goldner, University of Tennessee. The society celebrated its twenty-fifth anniversary in 1947. It now has 32 local chapters and 3200 members. A minimal scholastic standing of 85 per cent is required and at least second semester junior standing. Both men and women are eligible.

The following have been elected officers of the American Pharmaceutical Association and will be installed at the annual convention in San Francisco during the week of August 8, 1948:

President-Elect..... Ernest Little, Newark, N. J.
First Vice President-Elect Mearl D. Pritchard, Buffalo, N. Y.
Second Vice President-Elect
..... Frederick D. Lascoff, New York, N. Y.

Member-Elect of the Council for a term of one year:

Hans S. Hansen, Chicago, Ill.

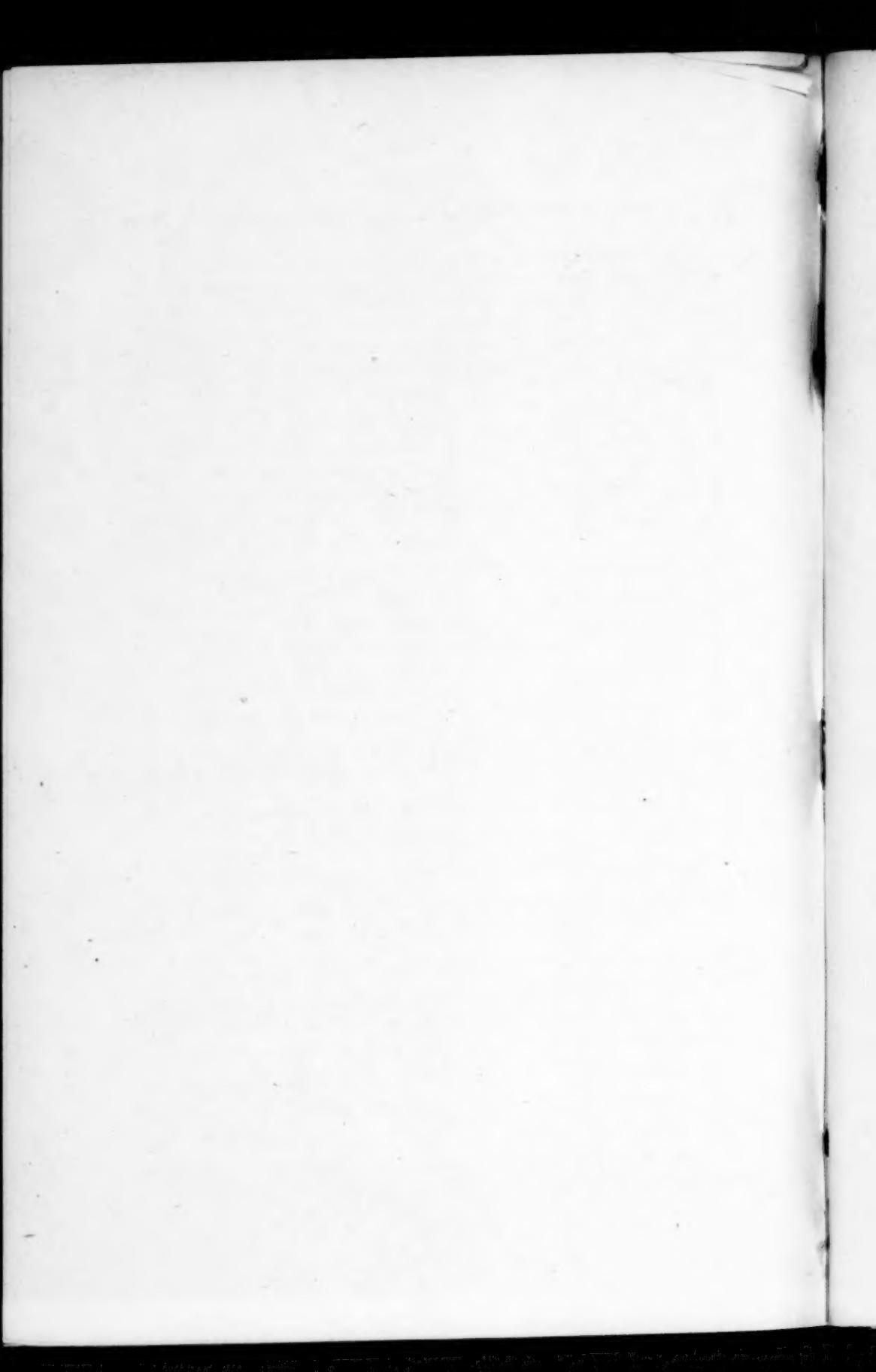
Members-Elect of the Council for a term of three years:

Martin E. Adamo, Boston, Mass.
Don E. Francke, Ann Arbor, Mich.
Robert L. Swain, New York, N. Y.

The present officers of the American Pharmaceutical Association who will continue to function until the San Francisco convention in August, 1948 are:

President Sylvester H. Dretzka, Milwaukee, Wis.
First Vice President August J. Affleck, Sacramento, Cal.
Second Vice President Roy L. Sanford, Enid, Okla.

The Secretary and the Treasurer are elected by the House of Delegates.



INSTITUTIONS HOLDING MEMBERSHIP IN THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY (Concluded)

New Jersey

Rutgers University, The State University of New Jersey, New Jersey College of Pharmacy, Newark (1923)
Thomas D. Rowe, Dean

New York

University of Buffalo, School of Pharmacy, Buffalo. (1929)
A. B. Lemon, Dean

Columbia University, College of Pharmacy of the City of New York. (1939)
Charles W. Ballard, Dean

Fordham University, College of Pharmacy, New York. (1939)
James H. Kidder, Dean

Union University, Albany College of Pharmacy, Albany. (1945)
Francis J. O'Brien, Dean

North Carolina

University of North Carolina, School of Pharmacy, Chapel Hill. (1917)
Marion L. Jacobs, Dean

North Dakota

North Dakota Agricultural College, School of Pharmacy, Fargo. (1922)
William F. Sudro, Dean

Ohio

Ohio Northern University, College of Pharmacy, Ada. (1925)
Rudolph H. Raabe, Dean

University of Cincinnati, Cincinnati College of Pharmacy. (1947)
Lyle Klotz, Dean

The Ohio State University, College of Pharmacy, Columbus. (1900)
Bernard V. Christensen, Dean

University of Toledo, College of Pharmacy, Toledo. (1941)
Charles H. Larwood, Dean

Western Reserve University, School of Pharmacy, Cleveland. (1902)
Arthur P. Wysa, Dean

Oklahoma

University of Oklahoma, School of Pharmacy, Norman. (1905)
D. B. R. Johnson, Dean

Oregon

Oregon State College, School of Pharmacy, Corvallis. (1915)
George E. Crossen, Dean

Pennsylvania

Duquesne University, School of Pharmacy, Pittsburgh. (1927)
Hugh C. Muldoon, Dean

Philadelphia College of Pharmacy and Science, Philadelphia. (1900)
Ivor Griffith, Dean

Temple University, School of Pharmacy, Philadelphia. (1928)
H. Evert Kendig, Dean

University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh. (1900)
Edward C. Reif, Dean

Philippines

University of the Philippines, College of Pharmacy, Manila. (1917)
Patrocinio Valenzuela, Dean

Puerto Rico

University of Puerto Rico, College of Pharmacy, Rio Piedras. (1926)
Luis Torres-Diaz, Dean

Rhode Island

Rhode Island College of Pharmacy and Allied Sciences, Providence. (1926)
W. Henry Rivard, Dean

South Carolina

Medical College of the State of South Carolina, Charleston. (1946)
William A. Prout, Director

University of South Carolina, School of Pharmacy, Columbia. (1922)
Emery T. Motley, Dean

South Dakota

South Dakota State College, Division of Pharmacy, Brookings. (1908)
Floyd J. LeBlanc, Dean

Tennessee

University of Tennessee, School of Pharmacy, Memphis. (1914)
Robert L. Crowe, Dean

Texas

University of Texas, College of Pharmacy, Austin. (1926)
Henry M. Burlage, Dean

Virginia

Medical College of Virginia, School of Pharmacy, Richmond. (1908)
R. Blackwell Smith, Jr., Dean

Washington

State College of Washington, School of Pharmacy, Pullman. (1912)
Pearl H. Dirstine, Dean

University of Washington, College of Pharmacy, Seattle. (1908)
Forest J. Goodrich, Dean

West Virginia

West Virginia University, College of Pharmacy, Morgantown. (1920)
J. Lester Hayman, Dean

Wisconsin

University of Wisconsin, School of Pharmacy, Madison. (1908)
Arthur H. Uhl, Director

FELLOWSHIPS IN PHARMACY

To meet the demonstrated need for trained teachers and researchers in the field of pharmacy, the American Foundation for Pharmaceutical Education announces a limited number of Fellowships for students seeking graduate degrees in pharmaceutical subjects.

These Fellowships are open to students (men or women) qualified for registration in approved graduate schools (or colleges) for one or more of the following major fields:

PHARMACY
PHARMACEUTICAL CHEMISTRY
PHARMACOLOGY
PHARMACOGNOSY
(or closely related subjects)

Each Fellow will receive from the Foundation a stipend to cover the year of his appointment, plus an allowance for tuition and miscellaneous term bills. Fellowships are renewable for one year.

For further information concerning Foundation Fellowships, including application forms, write directly to the

Board of Grants,
AMERICAN FOUNDATION FOR PHARMACEUTICAL
EDUCATION

330 West 42nd Street

New York 18, N. Y.
